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APPENDIX No. 4

A. 1909

REPORT

OF THE

SELECT STANDING COMMITTEE

ON

FORESTS, WATERWAYS AND WATER-POWERS

FIRST SESSION, ELEVENTH PARLIAMENT

1909

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OTTAWA

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1909

[App. No. 4—1909.]

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HOUSE OF COMMONS,
FRIDAY, February 26, 1909.

Ordered, That the following members do compose the Select Standing Committee on Forests, Waterways and Water-powers:—

Messrs. Arthurs, Béland, Boyce, Campbell, Carvell, Chew, Currie (Prince Edward), Edwards, Fisher, Fowke, Haggart (Lanark), MacNutt, McLean (Sunbury), Magrath, Molloy, Monk, Perley, Pickup, Price, Richards, Savoie, Sifton, Tobin, White (Renfrew), White (Victoria, Alta.), Wilson (Laval).

Ordered, That the said Committee be empowered to examine and inquire into all such matters and things as may be referred to it by the House; and report from time to time its observations and opinions thereon; with power to send for persons, papers and records.

Attest,

THOS. B. FLINT,

Clerk of the House.

REPORT

The Select Standing Committee on Forests, Waterways and Water-powers, presented the Third and final Report of the said Committee, which is as follows:—

The fact that the Committee was organized late in the session made it difficult for the members to take the time necessary in following out inquiries which have been suggested, but, for the time during which it was possible to devote to the work, a considerable amount of valuable information has been obtained through evidence of expert officers of the Government. The evidence has been fully reported to the House.

The investigations made are extremely limited and incomplete, and cannot be carried to completion until next session of Parliament, but the evidence placed before the Committee is regarded as being sufficient to warrant definite recommendations upon two subjects.

1st. It has been shown that the officers of the Transcontinental Railway have framed and promulgated excellent regulations for the protection of forests along the line of the Transcontinental Railway, and that various plans are being adopted in the provinces of New Brunswick, Quebec and Ontario for enforcing these regulations. It is quite apparent that the result of the attention, which has been given to the subject, has been to very largely reduce the destruction of forests by fire which has heretofore almost always characterized the construction of railways through forest territory. Your Committee, however, are impressed with the belief that a great amount of additional attention should be given to the enforcement of the regulations and believes that the Commissioners would feel that their hands were strengthened in the work if they were supported by specific action on the part of the House of Commons. It is, therefore, recommended that the Commissioners be asked to devote special attention to the enforcement of the fire regulations and to provide any additional staff necessary for that purpose; also that power be given to the Commissioners to expropriate additional width of right of way, where necessary, to provide adequate protection against fire.

2nd. Your Committee desires to call attention to the need for immediate action in regard to the conservation of the forests on the eastern slope of the Rocky Mountains. This territory, once heavily timbered, is no longer in that condition, although it contains a considerable quantity of merchantable timber. There has been very great destruction by fire even in recent years. The importance of preserving the forests on the tract in question cannot possibly be exaggerated. The rivers which flow down through Saskatchewan and Alberta, upon which, almost exclusively, the whole water supply for domestic, municipal and irrigation purposes of the population of these provinces depends, have their sources between the foothills and summit of the Rocky Mountains. Apart from the question of actual water supply, other matters of far-reaching importance are involved, such as the continued fertility of the soil, the regularity of the rainfall, and the moderation of the climate. These all depend upon the continuation of the flow of the rivers in question. When these rivers are used to their utmost limit, as at present distributed, the quantity of water there, leaving aside domestic and municipal supply, is sufficient to irrigate about two per cent of the irrigable land, while, if properly regulated and conserved, it would suffice to irrigate from sixteen to twenty per cent. Instead of moving toward a system of proper regulation of increasing the amount of efficiency of the water flow, the forest

land, which alone can sustain the supply, is being rapidly destroyed by fire owing to the insufficiency of the protection which is accorded. The officers of the Department of the Interior who are employed in connection with this work are believed to be active and efficient, but a larger and better organization and a much more extensive staff is required in order to cope effectively with the evil.

Not only the water supply, but the fuel supply is involved in the effective handling of this question. Western Alberta is very rich in coal, and the mining industry has passed the initial stages and is no doubt upon the eve of great development. A supply of timber at reasonable cost is essential for economical coal mining, and this timber should be procurable from the territory in the neighbourhood of the location of the mines. If such timber supply cannot be procured, it will add most materially to the cost of mining, and therefore to the cost of fuel. It is safe to say that unless very decisive measures are taken the supply of timber for mining purposes will very soon disappear.

In view of these facts, therefore, your Committee begs to recommend that immediate action be taken to enlarge the boundaries of the National Parks or Forest reserves and that a single continuous forest reserve be created from the International Boundary line to the northern watershed of the Peace River, embracing so far as possible the land upon the east slope of the mountains as shown in the accompanying tracing which has been prepared by the Forestry Branch of the Department of the Interior.

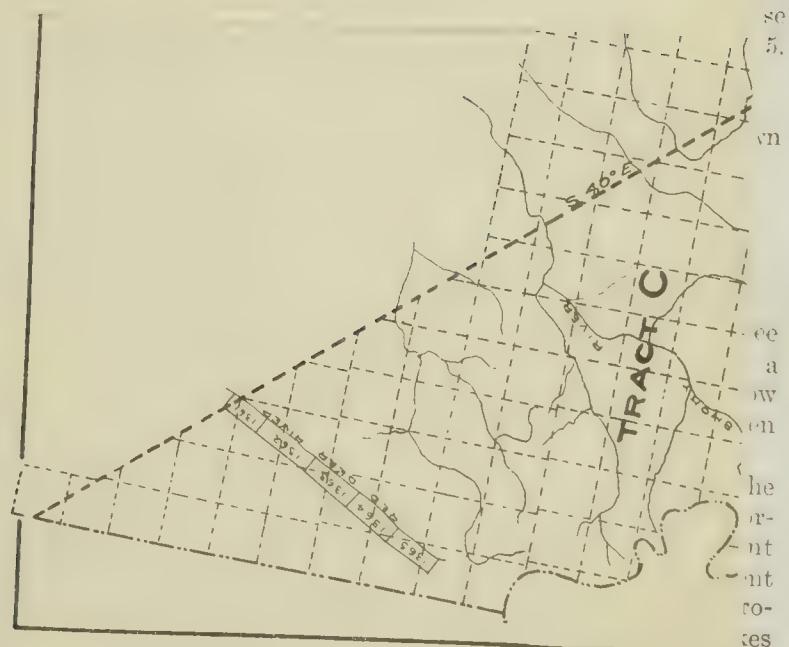
It is recommended that a competent warden, with an efficient staff be placed in charge of the reserve, above indicated, and that stringent regulations be provided for the purpose of, so far as possible, absolutely preventing the destruction of timber by fire, and for the further purpose of carrying on a system of reforestation whenever possible.

It is further recommended that an accurate forest survey of the territory included in the reserve, commencing at the southern and more immediately important portion, be carried on with all convenient speed, and that it be a portion of the allotted work of such survey to locate and determine upon possible reservoirs for the storage of waters within limits of the reserve.

If it be regarded as too late in the session to introduce legislation for the purpose of giving effect to the recommendations above set forth, your Committee would suggest that by executive action the reserve should, so far as possible, be constituted, defined, and put into effect, looking to the introduction of the necessary legislation at the next session of parliament.

CLIFFORD SIFTON,
Chairman.

HOUSE OF COMMONS,
May 17, 1909.



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MINUTES OF EVIDENCE

PART I.—WATERWAYS OF CANADA.

HOUSE OF COMMONS,
Room 34,

TUESDAY, April 6, 1909.

The Select Standing Committee on Forests, Waterways and Water-powers, met at 10.30 o'clock a.m., the Chairman, Hon. Clifford Sifton, presiding.

Mr. R. E. YOUNG, D.L.S., Superintendent of Railway Lands, attended before the Committee.

The CHAIRMAN.—Mr. Young, this Committee has been formed for the purpose of considering the question of forests, waterways and water powers, and it was ordered at the last meeting that you should be asked to make a statement giving the Committee, as far as possible, a recital as to what has been done in regard to the preparation of information with the object of preserving and conserving these great natural resources and channels of communication. Before we proceed to hear Mr. Young, I would suggest to the Committee that some honourable gentleman move that we report to the House this afternoon asking to have the quorum of this Committee reduced from 10 to 5. If we do not do that we shall never get a meeting.

Motion made and agreed to.

Mr. FOWKE.—Will the addresses delivered before this Committee be taken down for publication later?

Hon. Mr. FISHER.—Yes.

PRACTICABILITY OF INLAND NAVIGATION.

Mr. YOUNG.—I have had some difficulty in understanding just what the Committee expected of me, and I have not had much time for preparation. I want to devote a few minutes to the matters which the Committee has charge of, and if you will allow me, I will reserve the order in which they are named and take waterways first, then water powers, and finally forests.

In regard to the waterways east of Lake Superior, I think the members of the Committee are better informed than myself. I have a number of reports and memoranda on that part of Canada which were placed in my hands for use at the recent conference at Washington, including a report from Mr. St. Laurent, of the Department of Public Works, on the Georgian Bay canal; a report from Mr. W. J. Stewart, Hydrographer to the Marine and Fisheries Department, on the navigation of the great lakes and conservation of power, and a history of the Ship Channel from the Deputy Minister; the report of the Railways and Canals Department of 1907 on the canals and the report of Mr. Butler, Deputy Minister of Railways and Canals, on transportation. These memoranda and reports contain a great deal of valuable information. As to the western waterways I thought I might say a little that would interest the committee. I have had a good deal of difficulty in collecting information, but I have a paper which was prepared a good many years ago by Mr. John Ross, who built the north shore line of the Canadian Pacific Railway, and which was published by him in 1895. He had expressed the expectation that in the future those waterways would assume a

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great deal of importance, and I will read you one or two extracts from his paper. He opens up by giving some explanation of the development that had taken place in the waterways east of Lake Superior, and the paper goes on to say:

'But the all important step, and the one which should most deeply engage the attention of the country at the present time is the extension of the navigation from Lake Superior westward to the heart of the continent so as to develop the agricultural land of the Northwest Territories in a manner commensurate with their extent and importance; and in this way bring their traffic to the St. Lawrence and our ocean ports. When the population of these Territories comes to be counted by millions and tens of millions, as in course of time it will be, all the railroads likely to be built would not suffice to carry their surplus productions to the ocean, at least at such rates as would be satisfactory to agricultural communities. But through these wide regions nature has provided a highway for cheap transportation which can, at an outlay which the Government might well bear, be rendered available.'

He discusses the possibility of transporting the products of the western prairies by water shipments or in part by means of a railway over the height of land in Lake Superior, and then he goes on speaking of west of the height of land.

By the Chairman:

Q. Does he say what the elevation is of the extreme height of land above Lake Superior?—A. Yes, he tells that.

Q. How many feet is it?—A. The difference in the elevation is 850 feet. That is between Lake Superior and Lac des Milles Lacs.

From the city of Winnipeg by way of the Red River, Lake Winnipeg and the Saskatchewan to Edmonton, the waterway, as is well known, is susceptible of being made available to steamers of light draft, perhaps stern wheelers such as are used on the Mississippi. But from the city of Winnipeg to Lac Bourbon (Cedar Lake) on the Saskatchewan, the route by way of the Assiniboine and the Manitoba and Winnipegosis lakes has its advocates, and they claim that it would open a finer country and be more sheltered than the route by Winnipeg. Which of the two would be the less costly is a question for consideration. In the one case the Red River itself between the city of Winnipeg and the Stone Fort would require a good deal of improvement, and the Grand Rapids at the mouth of the Saskatchewan would have to be dealt with, while in the other a good deal of canal work would be necessary between the Assiniboine and Lake Manitoba, as well as between the Manitoba and Winnipegosis lakes, where there is a difference of 18 feet in the level, and again between the last named lake and Lac Bourbon, where although there is no great difference in the level the excavation would be considerable. We have thus west of the height of land at Lake Superior, 1,500 miles of direct waterway without reckoning the many branch waterways which could be made subsidiary to it at no extraordinary cost. In drawing attention to the practicability of rendering these inland waterways available to navigation, I have so far offered no opinion as to the scale that should be adopted in the event of the work being ever undertaken. It is a point requiring much consideration, but in this regard I may at once say that canals and locks on such a costly scale as those of the St. Lawrence need not be thought of, inasmuch as they would not be required. From Lake Superior to the head of the Saskatchewan a minimum depth of 6 feet is probably all that could be obtained, and certainly more than all that would be needed. Vessels drawing far less than 6 feet are nowadays constructed of a carrying capacity equal to that of large ocean-going vessels, that is of course in well sheltered waters, and perhaps a canal system similar to that which has been attended with such wonderful development on the tributaries of the Ohio and on other rivers of the United States, might be found to be well adapted to the great rivers of the central section of this Dominion. At all events, it is deserving of consideration.

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IMPORTANCE OF INLAND NAVIGATION IN CONNECTION WITH GROWTH OF THE WEST.

There is some more information, but I do not propose to go into it any further. It seems to me that the increasing importance of the inland waterways question in the United States points to us that this question is not chimerical by any means. It attracted my attention at the time that paper was published, because the gentleman who read it is an engineer and contractor well known throughout this country. In the United States every river possible for navigation is now considered of importance for that purpose. If we may expect a similar growth in our western country, the same condition will be reached with us. Of course the season is not so long. In emphasizing the importance of the inland waters question in Western Canada, I would like to ask the committee to give me five minutes on the land situation in Western Canada to which I have devoted some thought. I would suggest that you should look at our homestead map. That is the first edition published, I think in 1905. It was the first that was made to show the condition at that time of the homesteads. I would also like you to look at this map which was published on January 1, 1909, and compare the progress indicated by the colouring.

By Mr. White :

Q. What is the date of this map?—A. I think it is 1905, January 1, 1905. Both maps show the homesteads of the previous year.

By Hon. Mr. Fisher:

Q. What is the red?—A. The red are the homesteads of the previous year, and the dark gray are the patented homesteads. The green indicates the even sections which have been disposed of otherwise than to settlers, that is in railway grants and otherwise. It seems to me that these maps tell us the whole story of the progress of the west, and assist us to understand that the waterways may be of great importance. The story told by this map is hardly complete because it only shows even sections. On September 1 last, the odd sections were opened to settlement and the figures made up for your information show that the area granted to settlers from September 1, to January 1, was 5,300,000 acres. I think about half of that would be on odd sections: so that while this recent map shows an enormous advance in settlement on the even sections, there will be an addition to that of two and a half million acres on odd sections. There is a second point I would like to make about the progress of the west, and I will give it to you in this way. The total area surveyed shown on the lower map is 134,000,000 acres. Now it is a fact that wheat is grown successfully almost everywhere in that area. The land surveyed is all agricultural land. We only survey the agricultural land. Therefore, I think it would be fair to measure the annual results with confidence that might be expected in the future, if we deduct half of the surveyed area. The area under grain cultivation in 1908, the latest figures I have, was 9,600,000 acres. If you divide that amount into one-half the surveyed area, namely, 67,000,000 acres, it will go about seven times. Now I think a statement from the Trade and Commerce Department that was prepared for me in December or January shows that the value of the grain products of the Northwest for 1908 was \$143,000,000. The amount of the crop is now known to be greater than it was then. The prices are higher, I think, but even at that it is surely a fair conclusion to make, to multiply that \$143,000,000 by 7. I do not think that will be considered unreasonable. If you multiply that by 7 you get a future grain production which may be reasonably expected of over \$1,000,000,000, and that does not include the cattle and other products which according to an estimate I have, amounted to over \$17,000,000 in 1908. It should also be borne in mind that I have not included the country north of the surveyed area as to which I have devoted a good deal of study, and which, I expect, will be a country that will produce a great deal of grain and other products.

By Hon. Mr. Fisher:

Q. The surveyed area now goes, roughly speaking, to Athabaska Landing?—A. The furthest point north is Athabaska Landing, but there are a few townships in the Peace river district.

Q. It would not include any of the country north of Athabaska Landing?—A. You mean the surveyed area?

Q. Yes?—A. No, not by any means.

Mr. MAGRATH.—It shows it in the map in red.

By Hon. Mr. Fisher:

Q. Well, the area generally north of Athabaska Landing is not surveyed?—A. No.

By Mr. Fowke:

Q. It is practically confined to the three provinces?—A. I am speaking of the three provinces entirely. I am endeavouring to make the point as to the progress we may expect in the Northwest, and to illustrate what seems to me the importance of considering the western waterways. There is a third point which I would like to speak about, as to the land situation in the United States. I have a pamphlet published in January by the Forest Service of the United States called 'The Future Use of Land in the United States,' and if I have estimated the conclusion there reached correctly, I think it would be worth considerable careful study on the part of every one here, and I think by every Canadian. The writer points out that by 1950 the United States will have a population of 150,000,000 people, and this is considered a conservative estimate. Some estimates are as high as 200,000,000. The writer points out that in order to provide for the necessities of a population of that number in the United States, it will be necessary for them to utilize all their land area. There will be so much of it of necessity devoted to forests and in other ways, such as a population of that number would require, and it is quite clear that the demand for land is going to be very much greater, is going to increase at a rate that we little realize in Canada, and that certainly they are going to come into our country. I do not think it is an extravagant opinion to express, that all the agricultural land in Canada, not only in western Canada, will be enhanced in value and will be very considerably in demand long before 1950 by reason of the pressure in the United States. There is another point that I would like to make on that question of the American population. The census of 1900 showed an increase in the United States of fifteen times the population in 1800. That is to say, the population in 1900 was fifteen times greater than it was in 1800. The population in Europe increased scarcely double in that time. With respect to the growth that we may look forward to in Canada, we should have a somewhat similar experience to theirs. We have their population to draw upon, while they draw their population from across the ocean. Their increase in population by immigration is nearly one-half of the total increase, the figures being 31,000,000 by immigration and 35,000,000 natural increase.

By Hon. Mr. Fisher:

Q. That is in the whole century?—A. Yes, in the 100 years. Now, all those figures that I have given to you, seem to me to point to the desirability of considering the waterways to which, so far as our western prairies are concerned, few people seem to have given any thought. The only information I have been able to gather is in the paper of Mr. John Ross which I remember to have seen when it was published. If the argument is sound that those western waterways will be of great importance and that the increase of population will be as great as we expect there, it is also of importance that we should consider the northern waterways extending to the Arctic ocean. I have a map and I would like to ask your attention to it for a moment. It has been specially coloured to bring out the important points. You will see that from Fort

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McMurray about 275 miles north of Edmonton, perhaps 300 miles, we have navigation for 287 miles for about two and a half feet draft. That is the minimum down to Fort Smith. From Fort Smith going up the Slave river and up the Peace river we have navigation for 320 miles for two and a half feet draft. There is a drop on the Peace river in, I think, less than three miles, a fall of 24 feet, and above that we have 550 miles of navigation with a 2-foot draft to Hudson's Hope. From Fort Smith we have an uninterrupted navigation for 1,299 miles to the Arctic ocean. There is a break at Fort Smith of about 16 miles with a fall of about 250 feet. Then again there is the navigation of Lake Athabaska. I have not the exact dimensions at the moment but they are considerable. Then we have Great Slave Lake which, of course, is navigable throughout, being very deep, and larger than Lake Erie. It seems to me that in the present and prospective development of our prairie country, the navigation of those waterways as well as the development of other resources in that north country will be of great importance. If we look forward to a population of many million people in our prairie country, there is no question that the navigation of those waterways will furnish access to natural resources of great value in that north country. There is another stretch of navigation in that north country that we have not heard much about, and I do not think that I am indulging in any fantastic ideas when I say it will be of great importance. If the Hudson's Bay Railway becomes an accomplished fact, a man ought to be able to get on a train at Ottawa to-day, and in four days be in Fort Churchill. In three days he could be at the head of Baker lake. I have reports that show that that could be done. There is 10 feet of navigation up the Chesterfield Inlet from Hudson's Bay to Baker Lake, something over 210 miles. From Baker Lake it is possible to get into the Thelon River which will give a navigation of over 300 miles. Now from the study I have given to the question I think we have every right to expect that in the future, there will be an enormous mineral development in the bare or treeless lands. That development has been almost impossible up to the present, but when a man from Ottawa within one week will be able to reach the head of Baker Lake in the heart of the treeless lands, and if the copper and other deposits which are expected to be found there are there, it will be readily seen that the development of those waterways will be a matter of very great importance.

By Mr. Boyce :

Q. How far is Baker Lake above Fort Churchill?—A. It will be about 350 miles in a straight line.

By the Chairman :

Q. How far is navigation from the shore of Hudson's Bay towards the west?—A. I will give you the information I have. This is from Mr. J. W. Tyrrell's survey between the Great Slave Lake and Hudson's Bay, published in 1901:

'I was unable owing to the short time at my disposal, to make anything but a cursory examination of the general depths of the water traversed, but I took soundings enough to satisfy myself that vessels drawing 10 feet of water would have no difficulty in travelling from Hudson's Bay to the west end of Baker Lake. Here boat navigation must end as far as the river between Schultz and Baker lakes is concerned, owing to rapids at either end of the river that would in low water not permit of the passage of any craft larger than a York boat.'

On page 35 of the same report in reviewing the result of the exploration Mr. Tyrrell gives the following as one of the results:—

'The discovery of the Thelon River, one of the finest in Canada, navigable for river steamers or other boats of light draft all the way from Hudson's Bay to the forks of the Hanbury, a distance of 550 miles, excepting perhaps a few rapids on the river above Baker Lake where some improvement to the channel might be made. Just what length of time this route may be open for navigation I am unable to say precisely,

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but would judge that the river portion must be open at least five months, and the inlet and larger lakes about a month less, namely, during the months of July, August, September and October.'

I have a report which was compiled for me on New Ontario, and I believe that every source of information was exhausted to get what I have, and I was struck with a statement in it. I am unable to give you any more than what I have.

By Mr. Boyce:

Q. Is that report printed?—A. It would not be, for it is an incorporation of everything we could find from a great variety of sources.

'The region is watered by the Moose River flowing into James' Bay and its tributaries, the Abitibi, the Mattagami and Missinabie, and the Albany and its tributaries, the Kenogami and Ogoki. Each of these rivers is over three hundred miles in length, and they range in width from three hundred to four hundred yards to a mile. They are fed by numerous smaller streams, and these in turn drain numerous lakes of larger or smaller size, so that the whole country is one net work or waterways affording easy means of communication with long stretches of navigation.'

I have devoted a good deal of study to the possibilities of development in new Ontario, and I believe that there will be great development, and therefore that the question of waterways in New Ontario is worthy of investigation. Now, I do not think that I can tell you anything more about waterways, but I might interest you for a moment in the question of water powers.

By Mr. White:

Q. Before you leave the question of waterways, let me ask you this. It has been said that Canada really holds the key to the transportation problem of the North American continent, with regard to waterways particularly. In your study do you find that that is true?—A. It is a question a little outside of my fields of study or knowledge. I thought that the papers I have respecting the waterways east of Lake Superior would be of interest, and perhaps the officials who prepared those papers for me, would be able to give you more valuable information than I could.

WATER POWERS IN CANADA.

By Mr. Boyce:

Q. Have you any information about the waterways in the north?—A. The information I have is entirely devoted to those waterways which I have touched upon, that is, the undeveloped waterways in western Canada. Now, on the question of water powers, I have taken some interest, because in the course of my official duties in the Department of the Interior, I have to look after the powers which are on Dominion lands. About a year ago, my assistant, Mr. Challies, engineer of my Branch, and I discussed the desirability of getting information on the water powers of Canada, and as a result we wrote letters to engineers in other parts of Canada who would probably be interested in the matter. It was our idea that we should get together what information we could on the whole subject of water powers in Canada. We judged from the class of inquiries that were coming to us that general information regarding the water powers of Canada was very much needed, and in correspondence with the engineers to whom we wrote, we found there did not appear to be any information of that kind. They all said they would be extremely pleased if they could get hold of such information. We have been studying it a little since.

When the conference was at Washington in February, or rather when the Canadian Commission was appointed to go down there, I had a very limited time within which to get together some information on the water powers as well as on a number of

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other subjects. Consequently I do not pretend to say that this information is complete. I think it is very conservative, but it will give you some figures which, although incomplete, may surprise you. We have a summary of the total horse-power available from the different water-powers of Canada, and I think they are the minimum. In the Yukon we put it down at 470,000 horse-power; British Columbia, 2,065,500; Alberta, 1,144,000; Saskatchewan, 500,000; Manitoba, 504,000; Northwest Territories, 600,000; Ontario, 3,129,168; Quebec, 17,075,939; New Brunswick, 150,000; Nova Scotia, 54,300, or a total of 25,692,907. Georgian Bay Canal powers would make an addition of 1,176,310. It may be pointed out that a large proportion of the power in Quebec is in the falls of the Hamilton river. It has been estimated at anything from 9,000,000 to 15,000,000. The available horse power at Niagara Falls is about 3,000,000.

By Mr. Béland:

Q. Mr. Low's report with respect to Hamilton River Falls is 9,000,000?—A. Yes, but in another place it is estimated at as much as 15,000,000.

By Hon. Mr. Fisher:

Q. What do you estimate it at?—A. I think it is put down at 9,000,000.

Q. Then apart from that, there would be about 8,000,000 in Quebec?—A. Yes. Hamilton river is put down at 9,000,000.

Q. That leaves 8,000,000 in Quebec apart from Hamilton river?—A. Yes, and in New Brunswick 150,000. Now, I am assured by several of the men to whom I have shown these figures, that they are altogether too conservative. I impressed on the members of my staff that I wanted to be safe.

By Mr. Magrath:

Q. Did you put in 3,000,000 for Niagara Falls?—A. I could give you the figures for Niagara Falls. They are the figures of the Hydro-Electric Commission and they would give you the total on both sides of the line.

By Mr. Béland:

Q. The Niagara Falls are not included in your estimate for Ontario?—A. I am not quite sure, but I think the Niagara power is limited to 425,000 by the Waterways Treaty. My assistant made a little calculation for me from those figures. He says that five pounds of coal per hour per horse-power equals 21.9 tons of coal per annum per horse-power (24 hours). These figures he got from the Ottawa Electric Railway.

By the Chairman:

Q. Will you repeat that please?—A. Five pounds of coal per hour per horse-power equals 21.9 tons of coal per annum per horse-power (24 hours). If you can convert my total of 25,692,907 of horse-power, minus the 486,887 which is in use, you get 25,206,020, and that is equal to 552,011,838 tons of coal per annum. I heard an address by Professor Adam Shortt the other night in Ottawa before the Ottawa branch of the Canadian Society of Civil Engineers. His subject was the conservation of the natural resources of Canada, but he devoted almost all his entire time to the discussion of the water-powers of Ontario and Quebec. He believes that in the course of time, although he says it may be a long way ahead, in the provinces of Ontario and Quebec, through the development of the water-powers, if properly developed and conserved, there will be a condition of affairs similar to that which has prevailed for many years in the north of England. The manufacturing of the world to a very considerable extent has been carried on there in England, and he pointed out that 150 or 200 years ago that district was a sheep walk. Coal had been known to be there for many years before it was used for manufacturing purposes, and he claims that with the powers we have in Ontario

and Quebec, we will in course of time see a similar development. He stated that we would have the manufacturing mainly on the continent of America carried on in that part of Canada and under very much better conditions than those under which the development had taken place in the north of England. Of course the conditions for employees, the conditions under which manufacturing is carried on are very much better in every way where the power is from water than where it is from coal. In giving you those figures I believe that they are very much within the mark, but they only emphasize the absolute necessity of getting some better information. I am not prepared to say how it can be got. For instance, from British Columbia we could only get a lump figure of about 2,000,000 horse-power. It was hardly more than a guess. In fact outside of the province of Ontario the information is very crude indeed as to any of those powers. I am certain from my discussion of the subject with engineers, that it would be of immense value to Canada if we had more precise information. Just one point more with regard to that. I have an extract from an address of Mr. S. R. Poulin, one of the engineers of the Transcontinental, delivered about a fortnight ago in Winnipeg. He says:

'Although the question of operating the road by electricity has not yet been taken up, he had not the least doubt that as soon as the road opened the question of using electrical energy as the motive power for a large portion of the line would be made a matter of deep study. One reason for that belief was the long distance that fuel for the central portion of the road would have to be hauled, and another reason was the fact that magnificent water powers were to be found all along the line.'

By Mr. Boyce:

Q. Are the Commissioners of the Transcontinental investigating the question of water powers along the line?—A. I am not able to say. Mr. Poulin, no doubt, had a great deal of information on which to base that statement, but what it is I do not know.

QUESTION OF FORESTS, FOREST FIRES, ETC.

Now, on the question of forests, I would ask you to look at the forestry map of the Dominion, prepared by the forestry officers of our department. There is no doubt that with regard to our forests, we are in a state of extreme ignorance. It is astonishing to find how little information there is available about our forests. The forestry officers have prepared that map from the best information they have, and I would particularly draw your attention to the northern part of it to show you how inaccurate I know it to be, and how deceptive it is as to the forests we have. But on this whole question of forestry the forestry officers of our department would be able, I think, to give the Committee much better information than I can. It is not my subject, although I have studied it. In connection with this, I had figures prepared for the conference at Washington, and the information was given to me that the estimates of forestry in Canada vary from 800,000,000 acres down to 100,000,000 acres. The Governor General used an estimate in addressing the Forestry Convention in Toronto of 254,000,000 acres, and I suppose that is about the best. That is from the latest available information. But there is no doubt that our forest area containing merchantable timber and pulp timber, is very much less than that of the United States. I would think that the statement was without doubt, from my reading of the subject, not in pulp timber alone, but in merchantable timber, our area is very much less than that of the United States. I was very much surprised to find in Washington that nearly every one I spoke to, seemed to look upon Canada as a storehouse of timber, and to think that there was no limit to it. The area containing merchantable timber is liable to be less rather than more than our estimate. Forests are unlike any of the other natural resources we have. They

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are likely to shrink on examination. That is my study of it. Now, you will see coloured there on the map on the third belt from the north, 'northern forests densely wooded.' There is no such area of densely wooded forests there. I would ask you to look at the map on the other side of the wall, which has been prepared in my office, that is, of the portion from Hudson Bay west to the Rocky Mountains. The idea of colouring that map was to show by way of the green colour what the probable value of the timber was, and I can tell you there was not a source of information that could be found in any quarter that we did not go through in order to get up that map. I have a report in detail covering 70 odd pages which that map was prepared to accompany. The lightest green shade on that map represents an area as to which we know absolutely nothing. It is unexplored.

By Mr. Magrath:

Q. If that light green colour is an unexplored area, which I know it to be, and if you have dense timber apparently to the east and west, are we not justified in assuming that the unexplored area also contains good timber?—A. I do not think so.

Q. If timber grows on either side, why should it not grow there? You have not reached the northern limit of the treeless area?—A. No, but as you go north in this country you find that the timber is very largely confined to the rivers and the immediate vicinity of rivers. We find that wherever travellers have gone, the report is that between rivers timber is of very little value.

Q. That is not due to climatic conditions or to inability to produce trees. It is probably due to fires or something of that sort?—A. As a general proposition valuable timber is found in the vicinity of rivers to a very great extent.

By Mr. Fowke:

Q. Is the country mostly rocky?—A. Oh, no, the soil of a large portion of that northern country is of the finest, but of course climatic conditions are against the growth of timber.

By Mr. Carvell:

Q. Would that remark as to the soil apply to the ridges as well as to the rivers?—A. It is a large country to generalize upon, but there is no question that the western part of that green covered area is generally covered by good soil. The eastern part of it is not, and timber is very small and of very little value. I do not like to use the term 'barren lands,' because it is unjust. It should be called the bare or treeless lands. It is far from being barren.

By Mr. Magrath:

Q. Looking at your other map, I understand that certain points are represented as wheat growing. If wheat grows all over that country, surely timber ought to grow?—A. I can only say to you that where there is no deep colour on that map we have no information. There is no exploration, but the remarks of the different explorers all point in the same direction, that when you leave the vicinity of the rivers, timber is of very much less value.

By Hon. Mr. Fisher:

Q. Of course, land between rivers is higher considerably than it is along the rivers, but is there any material difference in the height of land. Are the rivers in valleys or are they just slight depressions in the general table land?—A. I do not think generally they are very much below the general level. Of course, some portions of that country are covered by muskeg. It has been claimed that if those muskegs were drained, in fact it has been experienced, that timber grows.

Q. But under the natural state of the muskeg there is practically no timber, and the large portion between rivers is muskeg?—A. Along the Canadian Northern line, I have been told that in the vicinity of the railway where ditches have drained the country, the trees show noticeable increase in growth, and that is very much more the case east of Winnipeg on the C. P. R. Where those muskegs have been drained, there is a remarkable difference in the tree close to the ditches from those further back, and I suppose the cold nature of the soil in those muskegs prevents the growth of trees. But I believe it is generally a fact that in our western country, the timber is largely confined to the rivers and to the vicinity of the rivers. I will ask you to again look at the statement on the map that that belt is densely wooded. It is certainly not all densely wooded. Now I have some information regarding northern British Columbia. I have been trying to find out everything I could about northern British Columbia.

By Mr. Boyce :

Q. Where was the information procured for that map?—A. It has been compiled from various sources. It is an enlargement of a map published by our department. I hope I am not finding any fault with anybody in connection with this matter. I am trying to find the truth. I am giving the result of my investigations so far as they have gone.

Q. I see it is marked densely wooded and the character of the trees is indicated.—A. I think that the trees described are correctly described so far as they go.

The CHAIRMAN.—Would it be correct to say that that tract has not been densely wooded at any time in the past, speaking generally?

Mr. MAGRATIL.—I have penetrated into some of that country when I was surveying, and as Mr. Young says there is a great deal of muskeg in places. I found tamarack and a great deal of small timber as if it had been burned down and a new growth was coming up. I would say it is densely wooded but not with timber of commercial value, but you would not get 50 acres of it without scrub or timber of some kind on it.

Mr. YOUNG.—That is my point. I started out by speaking of the value of our merchantable timber, and that is why I say that these maps are deceptive. Now as to northern British Columbia. I will give you the result of our investigation:

The greater part of British Columbia is not so well timbered as is generally supposed. The large areas of the excellent timber for which British Columbia is famous are generally all south of the latitude of Bella Coola river (north of 52 degrees of north latitude). North of this there are only limited areas of good timber. Should you colour those areas reported good in dark green, and those reported poor or fair only a light green, you would find that the light green would cover the greater part of the country. It would include the valleys of the Chileotin, Black Water, Nechaceo, Upper Salmon, Bulkley, Naas, Upper Skeena, Stikine and Taku. The forest in these valleys have generally been destroyed by fire. In the wet coast regions the timber should be good, as it is protected by reason of the humidity of the climate from the forest fires which have ruined the forests of the interior. Unfortunately, however, there is little or no good soil in this rugged mountain region capable of supporting very large trees. This statement is true of Dean and Gardner channels, and the islands along the coast. Only in the river valleys do we find any considerable area of forest land, as in the Bella Coola, Skeena or Kitimat Arms and around Fort Simpson. In the inland country there are only a few scattered areas which in British Columbia would be considered as of any value commercially. William Fleet Robertson, the provincial mineralogist for British Columbia, in his trip from Essington to Edmonton via the Skeena river, Babine and Stuart lakes and Parsnip river says:—‘Of such as is called timber on the coast there is none in the district travelled through. Such timber as there is, is spruce, hemlock, lalsam, and jackpine. The best of it ranging from 12 to 24 inches in diameter and not tall for that diameter. Timber which would be

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even locally merchantable for lumber is scarce, the repeated forest fires have pretty thoroughly cleared out the greater portion of it, leaving only a few isolated patches of the older trees, while the subsequent growth has not as yet reached a size to make it of value for this purpose. Of these patches, probably the best is to the south of Babine lake towards its southeastern end, where there is a very fair body of spruce timber.' Further he says:—'There is an area of very fair spruce to the east of McLeod lake, but along the Parsnip river there is no timber fit for lumber.' In the Upper Fraser about where it makes its great turn to the southeast, there is no doubt much merchantable timber, as the climate is a moist one and the timber has been protected from fires.'

Then there is some reference to Queen Charlotte islands.

On this question of timber, the fact that stands out is the loss by fire. I don't think I can say anything more impressive than has been said hundreds of times by other people. But it seems to me the most extraordinary thing that a man has to consider about this country, is the rate at which our forests are being destroyed by fires. I have had a statement prepared for me by the Forestry Branch, of the great forest fires that have taken place in eastern Canada from 1825 on. In my study of the question of our northern forests, I have found the same thing. You will see brown patches in portions of that map which indicate points known to have been burned and it only represents a small part. I would just like to ask you to look for a moment at a book I have here entitled 'North American Fauna,' published in December last by the Bureau of Biological Survey at Washington. It is a biological investigation of the Athabasca and Mackenzie regions. There is a photograph of a tree on Great Bear lake; it is described as white spruce, near Leith point. The tree is nearly 2 feet in diameter, and was estimated to be at least 1,000 years old. Now, that is approaching the north limit of timber. The growth is not so slow as that further south, though very much slower than we are accustomed to in this part of Canada. When one reads of the destruction that is going on and has gone on in those northern forests, and when one remembers the loss that is involved in burned trees which will take 400 or 500 years to grow, it might easily be that the mineral development which I hope to see take place in that country, would become almost impossible, because of the lack of timber for mining purposes, for railway construction, and of course for the necessities of habitation. I think that one of the subjects worthy of great attention, if I might venture to say so, is the protecting of the northern forests from fire, and in fact the forests all over Canada. There is no question connected with forestry which seems to me to demand so much attention as the destruction of our forests by fire. I hope I am as enthusiastic a Canadian as any one in this room, and if I have ventured to say some things which seem to detract from the value of our forests as it is estimated by other people, I can only say that, in my opinion, we are deluding ourselves as to the condition of forests in Canada. And it is of tremendous importance that we should consider the question. The main point is protection from fire, and, in a lesser degree, the handling of our forests by more improved methods, and, of course, the reforestation of our forest denuded areas, where the land is not suitable for agriculture. I do not think there is anything else to tell the Committee at this stage, except perhaps that I might refer to the difficulty there is in getting information about this forest question in Canada. I do not know that I can offer any suggestions of value to the Committee about getting information in a clearer form. We have been holding forestry conventions for some years. They have done some good, but they have not accomplished all that they ought to have accomplished. If I might venture a suggestion, it seems to me that if this Committee could get the person who is the acknowledged expert in each province to come before the Committee not for the purpose of reading a paper as is done at conventions, but in order that the members of the Committee could cross-examine him and get from him what he knows, good results would follow. After getting that information as to each of the provinces, I think you would then have some valuable information about the whole country. I got one of our staff to go

down to New Brunswick and Nova Scotia, and he got a great deal more information than I have been able to get from other sources. I would also say that the gentleman who went down there, was met by the people who were only too pleased to be asked to give the information and were delighted at having an opportunity to help him.

By Mr. Fowke:

Q. Is it known that each province has an expert of that kind?—A. I do not think there is any question but that there is some person in each province, who has made a particular study of the question who will be acknowledged to be the man to go to. I might venture to say that I could give the Committee more valuable information in a detailed way about the northern country, if I were given more time to prepare it. I would not like to call myself an expert, but I have studied the subject and I am sure there are men in each province who could give you the information. I have been told that in the United States, the most effective method of awakening public interest has been by the publication at frequent intervals of bulletins showing the consumption of forest products. Nearly every person seems to be interested in reading these. I am not aware that we are collecting any such information in Canada or publishing it. If we were to take statistics of that kind and publish them at intervals, I think, it would interest people a great deal to know how much we are using of our forest products. There is just one point to which my attention has been drawn in connection with timber in western Canada. I have been told that on the Grand Trunk Pacific they imported recently 200,000 ties of southern yellow pine. The structures on the main line of the Canadian Pacific Railway west are mainly of British Columbia timber, and surely if we had valuable timber in our own west country it would have been used.

By the Chairman:

Q. The timber for the bridges of the Transcontinental, east of Quebec, were bought in British Columbia?—A. I have the statement from one of the officers of the Forestry Department that 200,000 ties were recently bought for the Grand Trunk Pacific Railway.

Q. Do you know what part of the line?—A. I cannot tell.

Mr. TOBIN.—The Grand Trunk has been importing ties into this country. We have had them in the eastern part of Quebec.

Mr. BOYCE.—The Canadian Northern has imported large numbers.

The CHAIRMAN.—They are paying 60 cents for ties in Saskatoon.

Mr. TOBIN.—What kind of timber?

The CHAIRMAN.—Jack pine or tamarack. Of course they do not pay that for spruce ties.

Mr. CARVELL.—They are paying 40 cents for spruce ties in New Brunswick to-day for the Grand Trunk Pacific.

Mr. TOBIN.—Down in the eastern townships you cannot get 25 cents for hemlock ties or cedar.

By the Chairman:

Q. Mr. Young, I think you are familiar with the nature of the country through which the Canadian Pacific Railway runs from North Bay to Port Arthur, having known it in the early years immediately after the road was built. What would you say so far as the timber was concerned?—A. I recall having gone over the line almost with the first train. I remember quite distinctly at one point turning to what was a lane. The right of way was merely a lane bordered on each side by magnificent forest trees. The point was near Biscotasing, now known as Bisco.

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Br Mr. BOYCE.—That is west of Chapleau?—A. I have often tried to find the place since, and I asked Dr. Judson Clarke, formerly of the Ontario Forest Service, about that timber, and he said there were traces of the fire that destroyed that timber all the way down to James bay.

Mr. BOYCE.—I beg pardon, Bisco is 60 miles east of Chapleau.

By the Chairman:

Q. What was the general character of the country all the way from Lake Nipissing to North Bay before the railway went in?

By Mr. Young:

Q. I cannot give any statement. I can only say that I can remember long stretches that were covered by splendid timber. I have a statement prepared by the Forestry Branch that:

‘Along the line of the Canadian Pacific Railway from Sudbury to Port Arthur, much damage was done by fires during the construction of the railway, and in the vicinity of Dog Lake the timber was destroyed for 30 miles south of the track. At an earlier date, pine forests were destroyed west of Fort William for a long distance, which have been replaced by poplar now fully grown or cut by settlers and miners.’

By Hon. Mr. Fisher:

Q. I suppose some of that timber was cut and used for the railway?—A. Yes. This statement goes on:—

‘Fires of sixty years ago burned over thousands of square miles on each side of the International line at Hunters Island, and it is probable that the large tract west of Lac Des Milles Lacs described in the reports of Captain Palliser and Professor Hind was destroyed about the same time. Much damage has also been done within the last fifteen years by fires on the Seine river and Rainy lake, the origin of which is blamed on mining prospectors. The fire of 1891 which swept along the Canadian Pacific Railroad for nearly 60 miles from Pogamasing Station to near Woman river, and a more recent one which burned over the same territory in 1896, and the entire shores of Biscotasing and Ramsay lakes and from the head waters of the Spanish and Mississaga river to near Flying Post north of the height of land, a distance of over 70 miles, Mr. Whitson says, alone devastated over a million and a quarter acres.’

That is from an address before the Ontario Land Surveyors’ Association last year.

By Mr. Boyce:

Q. What quantity was destroyed?—A. Over a million and a quarter acres. This whole paper on forest fires from 1825 would make any man think a good deal.

Q. Those fires are practically of recent occurrence?—A. Some of them. In 1825 there was one of the largest fires in Upper and Lower Canada and New Brunswick.

By Mr. Molloy:

Q. What would you suggest as being the best way of protecting the forests?—A. It is a very large subject. I have a good deal of information, but I think you should ask the forestry officers about it. I am rather out of my sphere in discussing forests at all.

The CHAIRMAN.—I think, gentlemen, that having heard Mr. Young we might at our next meeting ask Mr. Campbell, the chief of the Forestry Branch, to come. I would suggest that we ask him to have special information (first) about the forest reserves, and what conditions they are in for operating, then the question of fire protection, with special reference to the protection along the line of the Grand Trunk Pacific, and also along the line of the Canadian Pacific Railway where a great deal of damage has already been done by fire, and where the traveller can judge what is

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being done to prevent destruction. Travelling along from North Bay to Port Arthur there is a space that has been cleared, as a good many of you know, through travelling over it, of about 120 or 150 feet. Most of the area is covered by timber and dried grass just like tinder, and I do not see how it is possible to prevent fires so long as it remains in that condition. That area will never reforest itself unless protection is given. I would like to hear whether that is receiving any consideration. Then we could ask Mr. Campbell to speak generally. Is there any other particular subject on which any member of the Committee would like Mr. Campbell to prepare himself. If there is it would be better that Mr. Campbell should know.

Mr. BELAND.—There is the question of the cultivation of trees, afforestation and reforestation.

Mr. YOUNG.—A member of the Committee asked be what I thought might be done in the way of protecting forests from fire. I have an opinion as to something that might be done. I believe that this whole question of forest protection or the conservation of our resources of any kind can best be dealt with by publicity. We are not doing anything in that way in Canada compared to what is being done in the United States. When I was in Washington I was more impressed by what is going on in that way than by anything else I saw. They have a number of journalists in the employ of the forestry service who prepare newspaper stories from the information that the officers of the service supply, and these stories are given out. As the secretary of the Conservation Commission told me, 'When I speak, I speak through 4,000 newspapers.' He explained to me that if it was decided to endeavour to create an interest, say in the question of fires at a given time, they would cover the whole United States with special information on that subject or on any other subject they took up, and if they found that they were not producing sufficient results, they simply gave them more. That is how they are enlightening the public on that question in the United States. Take, for instance, a recent number of the 'Forest Quarterly,' published by our Forestry Branch. There is a story about the destruction of forests in the Crow's Nest Pass and if any one here has not read it, I would advise him to get a copy and read it. It is a most impressive thing.

Hon. Mr. FISHER.—It is appalling.

Mr. YOUNG.—Yes, it is appalling to read about it. It is well written and a very interesting publication, but how many people saw it? I venture to say, give them a live journalist, a man who is accustomed to writing every day and he would convert it into a story. I believe it has been done to some extent. It certainly has not reached the mass of the people and I believe more could be done to interest the people in this question in that way than in any other I know of.

Hon. Mr. FISHER.—Hear, hear.

The CHAIRMAN.—Are you posted with regard to the question of the water supply of the western prairie section?

Mr. YOUNG.—No, I think Mr. Campbell could give you very valuable information on that.

Mr. FOWKE.—Mr. Young spoke of a very interesting address recently delivered by Professor Adam Shortt. All of us know Professor Shortt speaks with accuracy, and I should like to move that at the proper time he be asked to address this Committee on the subject of the conservation of our natural resources.

Mr. YOUNG.—I have a pamphlet here which I think is very interesting. It is entitled 'Pulp and Paper Investigation Hearings' and is issued by the American Committee of the House of Representatives on pulp. It is the best collection of information on Canadian timber matters I have ever seen, and contains papers on the subject from all kinds of sources.

Mr. BELAND.—Is it evidence before the Ways and Means Committee?

Mr. YOUNG.—No, it is not evidence of witnesses. It is information collected while the Commission was in Canada.

The Committee adjourned to meet on Thursday, April 15.

PART II.—WORK OF THE FORESTRY BRANCH.

COMMITTEE ROOM No. 30,
HOUSE OF COMMONS,
THURSDAY, April 15, 1909.

The Select Standing Committee on Forests, Waterways and Water-powers met at 10.30 a.m., the Chairman, Hon. Clifford Sifton, presiding.

The CHAIRMAN.—Gentlemen, Mr. R. H. Campbell, who is Chief of the Forestry Branch, has been called to give evidence to us to-day, and he suggests that we should take up the work of the Forestry Branch under the following head:- (1) Fire-ranging and protection; (2) Forest reserves; (3) Timber surveys; (4) Timber sales; (5) Tree planting on farms, and (6) Forest statistics and publications. That strikes me as a very suitable method of dividing the work, and if it is agreeable to the Committee, Mr. Campbell will proceed under that arrangement.

Mr. R. H. CAMPBELL, Superintendent of Forestry: Mr. Chairman and gentlemen, the first division of the subject is fire-ranging, but if you will allow me, I would just like, before starting on the consideration of that branch of our work, to make a comparison between ourselves and the United States service, in order that if we have not accomplished as much in regard to forestry work as has been done in the United States, you will see the difference there is between us and the reason why we have not been able to do as much in that direction as they have. The Forestry Branch of the Department of the Interior was established in 1899 by the appointment of Mr. E. Stewart as Superintendent of Forestry. Mr. Stewart continued in office until 1st of March, 1907, when he was succeeded by the present superintendent. We have been working along since the establishment of the branch doing what we can, but we have only a permanent staff of some forty people, compared with the United States forest service, which was established in 1876, and which has a staff of over 2,000, including 300 technical men, with an appropriation of \$4,640,000, as against our appropriation of \$100,000. You will see from these statistics that they have an opportunity for getting at things definitely in a way that we of the Canadian service cannot as yet. Not only is the United States forest service well organized, but they have completed the surveys on all the federal forest reserves, and besides that, a number of states have completed surveys, altogether 23 states have completed their surveys, and 14 states have partially completed them, so that they are in a better position to know the exact condition of their resources than we can possibly be in Canada at the present time. None of the provinces have made any surveys of their forest reserves; the only attempt so far being that which was made by Ontario in 1900, when they sent a number of parties up through the north country for that purpose. In the Dominion territory, we have not been able to make any accurate survey except in the forest reserves, where we have something like ten million acres, and have surveyed only about a million and a quarter acres.

When the Forest service was established here, the first duty which impressed itself, was the protection of the timber under the administration of the Department of the Interior, which is located in the northern parts of the provinces of Manitoba, Saskatchewan and Alberta, and in the districts to the north of those provinces, and the two tracts in the province of British Columbia known as the railway belt, and the Peace River district. Previous to the establishment of the Forestry Branch, the

Dominion Government had not established a fire-ranging force for the protection of the forests. Fire rangers were first appointed in 1901, the number appointed in that year being 17.

The system adopted is to have the fire rangers act under the instruction of a district forest ranger, who is a permanent officer. The district ranger instructs the fire rangers when to begin their duties, the tracts they are to patrol, the reports they are to make, and the time when they are to cease the patrol. Fire rangers are required to keep a daily diary showing the routes travelled by them, and giving information in regard to the timber, fires, prosecutions under the Fire Act, and other matters of interest. The fire rangers are paid monthly, on accounts certified by the district forest ranger and accompanied by the monthly diary. During the first year, rangers were employed in Manitoba, Northern Saskatchewan, in Crow's Nest Pass, in Alberta, and in the railway belt of British Columbia. In 1903, the patrol was extended to Calgary and Edmonton. In 1907, a patrol was established along the Athabasca and Lesser Slave rivers, and we put another ranger on the Peace River in 1908. In 1908 a patrol was also made along part of the Churchill River in northern Saskatchewan, and in the district where the Hudson Bay Railway is to be constructed beyond the present extension to the Pas. There was excitement over a mineral find around Lac Laronge, near the Churchill River, which made it absolutely necessary that we should do something in there, and I sent a man in last summer.

The number of fire rangers employed during the year 1908 was 82, divided in the different districts as follows:—Prince Albert, 14; Battleford, 1; Edmonton, 20; eastern slope of Rocky Mountains, 12; British Columbia, 30. A special patrol was established along the line of construction of the Grand Trunk Pacific Railway west of Edmonton, with the result that no fires of consequence occurred. One-half of the cost of this service within five miles of the line of construction was, as provided in the Forest Reserves Act, charged to the railway company, and has been paid. The rangers reported that the company and their contractors were observing the regulations in regard to the disposal of the debris of clearing operations, and were taking all precautions against fire. A chief ranger has been sent out this spring to the Leavings of the Macleod River to manage the patrol from that point. Last year, the patrol was managed from Edmonton, rangers being sent out by the chief ranger, but it was found rather awkward working from Edmonton. The chief ranger will have as many rangers as necessity calls for, probably nine or ten, under him, and they will work from that point along the line of the railway. We hope in that way, with the assistance of the railway company, and with the contractors taking proper care, that we will be able to prevent any serious fires occurring in that district. The measures we have taken will, I think, be adequate to prevent loss at that point.

The greatest difficulties in the protection of forests from fires occur along the lines of railway. This is partly due to the construction and operation of the railways, and partly to the increased travel resulting therefrom. The routes of travel are the danger zones. The Fire Acts and the Regulation of the Dominion Railway Commission provide that locomotives shall be properly equipped with spark arresters and other means to prevent the escape of fire. In order that the fire rangers may have fuller authority to examine locomotives believed to be deficient in equipment, the Railway Commission has been asked to have at least the chief rangers authorized to act as agents of the Commission, so that they may have full powers to deal with any difficulty that may arise.

Notices giving the chief provisions of the Fire Acts are posted up by the fire rangers along the routes of travel. These are printed in several different languages. I might just show you (exhibits notice); these are the notices that we have posted up all over that country. They give many of the provisions of the Fire Acts as applied in the different districts, and they are posted in British Columbia, the Territories, and the provinces of Saskatchewan, Alberta and Manitoba. As I stated, they are printed in different languages, this (exhibiting notices) are in the Indian syllabic,

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that is in the Cree language, and this in the Chipewyan, we obtained the translation from two Indian missionaries. The notices printed in Cree and Chipewyan have been distributed in the northern districts. There are a number of points at which we can reach the Indians very well in that northern country. They have been educated at the missions and can read these notices in the syllabic. My proposal was to reach the Indians at the several missions. For example, in the district north of Prince Albert, there is an English Church mission. I have already communicated with the Bishop for this district, and he is willing to assist us in approaching the Indians and trying to get them interested in forest protection. There is a Roman Catholic mission at Pelican Lake and another at Split Lake, where the Indians meet for treaty purposes. There are several other places down the Mackenzie River that we hope to be able to reach.

FIRE RANGING.

In regard to fires last year 251 fires on Dominion territory were reported, most of which were extinguished without loss. The most serious fire was in the Spray River valley, province of Alberta, which was probably caused by tourists, and destroyed 4,000,000 feet board measure. Take this line here, for instance, on the Athabasca River. Here is a ranger going down along the river from Athabasca Landing to Fort McMurray, and up the Clearwater River. In this district there are 200 or more miles to travel. It is simply impossible that he can be everywhere where fires occur; he may be a hundred miles away from a fire. These men have done good work, and the reports that we have had from the man who is in charge, Inspector Conroy, of the Indian Department, are very satisfactory. I have also heard satisfactory reports from others. Count Von Haumerstein, whom perhaps most of you know, and who has interests of some extent on the Athabasca, says that the work along that river has been very good indeed. In the Lesser Slave Lake district, from the reports the fire rangers have given us, they have been able to put out fires that have burned for more than a year. Fires often get down into the muskegs and burn through the winter into the next year. The fire rangers have put out some of these old fires last summer.

If we are going to cover the whole district thoroughly, and do the work properly, we shall need to have a larger number of rangers. The main danger is along the routes of travel. These are the main routes (indicating on the map) that we are trying to cover now, and this is where the chief danger lies. Some fires occur from lightning, but as far as I have been able to gather any evidence, they are a comparatively small number. It is almost entirely where men go in, that the danger exists, and if we can guard the routes of travel we can cope with the worst difficulty that confronts us.

By the Chairman:

Q. What amount is expended on fire protection at present?—A. Last year the sum of \$45,000 was expended on the fire ranging service.

Q. How much money do you think you ought to have for this purpose?—A. We ought to have at least \$50,000 for the northern district, and another \$50,000 for the work in the remainder of our territory in order to begin to do it in a right way. I think that we should increase the number of rangers. We ought to put them along the upper part of the Athabasca River. This year, I understand, supplies are being taken in for the Grand Trunk Pacific Railway up this way, and a large number of freighters are going along there (indicating on map). For that reason it is going to be a little dangerous this year, and we must watch that place. We ought to have the fire ranging extended down the Great Slave River. There is good timber along the river on both sides, and we ought to have that better protected. The ranger from the

Athabasca River has gone down half way, but there ought to be a ranger for the Great Slave River in addition.

By Mr. Boyce:

Q. What extent of territory do you allot to a fire ranger?—A. We allot the territory in the best way we can. In the more settled districts where there are forest reserves, a ranger will not have more than 30 miles by distance. That would be about three or four hundred square miles he would have to cover. When we get up into the north country, we have to do the best we can.

Q. The fire ranger follows the streams, does he?—A. Yes, he follows the streams.

By Mr. Fowke:

Q. What sort of service do you expect of him as a preventive officer and one who has to extinguish fires?—A. Of course, he posts up notices. He is supposed to warn everybody he meets about fires, and explain to them the provisions of the fire laws, tell them the penalties there are for setting out fires and letting them run carelessly. He warns these people to put the fires out before they leave their camping place and then, if he finds that a fire has been left behind and allowed to run or left behind unextinguished, he may have the man arrested. At Dunvegan on the Peace River, our ranger summoned a man for leaving a fire behind him, and he was fined \$25. That was the first experience of that kind which they had in the district, and I think it has had a most salutary effect. The people there understand now that a law exists forbidding the practice, and that the law is going to be enforced.

By Mr. Boyce:

Q. These fire rangers have no summary powers?—A. They summon offenders before a magistrate, that is all they can do.

By Hon. Mr. Fisher:

Q. Have they not authority to call upon other people to help them put out a fire that is running?—A. Yes, they have. When a fire is beyond a fire ranger's control, he has authority to call upon anybody who is in the neighbourhood to help him.

Q. And it is the duty of the people thus called to go out to the fire ranger's assistance?—A. Yes, it is under the Provincial Act.

By Mr. Fowke:

Q. What method is pursued to put out the fire?—A. It depends, of course, a good deal upon the character of the fire. In the case of a ground fire if water is available, they can use it to extinguish the fire, but as a rule they cannot get water. Generally, the simplest way to handle such a fire is to dig around it and throw the earth back upon it. That is when it is a ground fire. That method is used quite successfully when the fire is burning down into the debris of the forest floor, or into muskeg or swamp, it is very difficult to extinguish even with water, and the only sure method is to dig around the fire. In the case of the fires I spoke of that were burning for a year, putting water on would have been no good at all. What the fire rangers had to do was to dig right around the fire and get the vegetable matter cleaned right out, so that the fire could not work through underneath.

By Hon. Mr. Fisher:

Q. Would that be in the woods?—A. It is partly in the woods.

Q. It would be an awful job to dig around a fire in the woods?—A. Yes, but that is what you have got to do. I assisted in doing that myself in British Columbia last summer, and that is the only way we can get it cleaned out. In order to keep the fire from going into the duff on the forest floor, you have to dig down into the earth and

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get it cleaned out. If the fire ascends into the trees there is no method that will stop it except the wind changes. In that case, you may so arrange it that the wind will blow back the flame over the burned area.

Q. A single fire ranger could not do much digging around the fire?—A. No, not if the fire got away from him and extended over a large area. In such a case the fire ranger is helpless. While good work is being accomplished by means of the fire ranging service, and while it is effective to a very large extent, if a fire once gets away from the ranger, he is almost helpless. He must extinguish the fire at the beginning. If he does not, it is a pretty difficult matter to do anything with it. We had one fire in Alberta, and two in British Columbia that the fire rangers did not succeed in checking at the start, and so they got out of hand. We spent a large amount of money trying to check those fires, but we could not do very much but just try to hold them in the line in which they were travelling until they reached the limit. Of course, when the wind changed, we could work back on them somewhat.

By the Chairman:

Q. Were any steps taken to prosecute the persons responsible for starting those fires?—A. The trouble is to get the evidence to convict them. We may be fairly sure that a fire has been started by somebody in a particular place, but the trouble is to get evidence that will convict the offender. The guilty parties do not as a rule proclaim their offence very loudly, and it is one of the most difficult things to get evidence that will convince a magistrate that the person charged is the guilty party. Nevertheless, so far as we can, we try to follow the offenders up.

I think we require a better supervision, so that the control will be carried out effectively, economically and in the proper places. In British Columbia, the supervision is good, but there should be a chief inspector of fire ranging for the northern district. The Crown Timber Agent at New Westminster, B.C., has general supervision over the timber in the railway belt in that province, and he looks after things pretty well. But in the northern country, we have a divided jurisdiction, and some of our men are not experienced. A good experienced man in general charge who could communicate with the rangers better, give them instructions and see that they attended to business, would, I think, improve the service considerably. I think it would be better to change the men from some of the districts we are patrolling, and put them into other districts, because those at present patrolled have become settled, and it is really not our business to undertake the duty now. I think that an inspector could do considerable to get the work into better shape in many ways. We are trying to improve the system of reporting. The rangers a couple of years ago, used to send in their diaries every year. Now we require them to report every month, where it is possible to do so, so that we can keep a better check on them. The chief ranger is supposed to look over the men's diaries and see what they are doing. In this way we can check their work, and ascertain whether they are attending to business. You will understand, however, that when a fire ranger goes out he cannot be followed, and unless he is a good man and thoroughly interested in his work, he might be careless and nobody know anything about it. The system of reporting monthly enables better supervision to be exercised. We try to follow them up carefully, but to ensure the best results, considerable supervision is needed.

By Hon. Mr. Fisher:

Q. Do your chief rangers supervise and inspect, is that their business?—A. Yes, that is their business. They have no special district assigned to them to range for themselves, but they are supposed to go out and see that these men are attending to business.

Q. They are held responsible for the men in their district?—A. Yes.

FIRE PROTECTION ALONG LINES OF RAILWAYS.

By the Chairman:

Q. What is your arrangement in regard to the protection of the forest where railways are being constructed?—A. Where railways are being constructed?

Q. Yes, have you got any way of making the contractors or the railway company responsible?—A. Yes.

Q. When a railway is being constructed, do you inspect and watch the territory through which it is being built?—A. Yes. In the first place they have to properly clean their right of way as required by the Railway Act, and by the regulations of the Railway Commission.

By Hon. Mr. Fisher:

Q. They have to destroy the debris?—A. Yes.

By the Chairman:

Q. Is all combustible material required to be removed?—A. Yes, or disposed of in some way.

Q. That is a comparatively recent provision?—A. Yes. Along the route of the Grand Trunk Pacific Railway, which is the only railway that has been constructed in the afforested territory, we sent our rangers, and the reports from them show that the company and their contractors are attending pretty carefully to this requirement. According to these reports, the contractors were cleaning up the right of way very well, and burning the debris on it. I wrote to the Grand Trunk Pacific Company and asked them to see that their engineers were instructed to be careful in that regard, and that their contractors were instructed to observe the regulations. Of course, in order to make sure that proper precautions are taken, we will have to have our own inspector on the ground, and that is why I asked particularly that we should have a man sent out on the Macleod River this year to have general supervision until construction is finished. I think that in the case of all the lines that are being constructed north, from Edmonton towards Hudson Bay, and at other points, we will require special men to look after each one of them, if we are going to prevent serious fires occurring. Our practice is to charge up half the cost for five miles on each side of the line being constructed, to the railway company.

Q. Does that arrangement apply when construction is going on?—A. Yes, while construction is going on. The Grand Trunk Pacific Company have already paid half the cost along their line west of Edmonton for which we billed them some little time ago.

The patrol should be extended, as I have just pointed out, to do anything at all reasonable in that northern district. It should go up the Athabasca and down the Peace River, and we should probably have a ranger down on the Mackenzie; at least there should be somebody to go and negotiate with the Indians. The only people up there are Indians and Hudson Bay employees, and I think we might perhaps get a man who is in the Hudson Bay Company's service. In any event, we shall have to have somebody who lives in there, because it is a difficult country to reach. It takes all the season to go in and come out. Probably it is 600 miles north of Edmonton. Hudson Bay boats are the only means of travel, and they just enter the country and come out again once in the year. We should have a fire ranger at Ile a la Crosse to communicate with the patrol from the Athabasca and from the Prince Albert district, and we ought to have the district around Lake Winnipeg and northward towards Hudson Bay patrolled. If the construction of the Hudson Bay Railway is proceeded with immediately, a number of men will be required at once in that territory. We should do something to patrol that district, and find out what is required; we have done nothing yet to protect it.

Along railway lines there is one trouble that occurs and that is in regard to the burning of the ties. The Canadian Northern Railway in the northern part of Sas-

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katchewan have required their men to gather ties that are to be burned at the sectional points, and burn them there instead of disposing of them at places here and there along the line of railway. These fires are then watched at the sectional points, and are not occurring indiscriminately over the line. When ties are burned at random with no person present to watch them, serious fires often occur. I must say for the Canadian Northern that on their line in northern Saskatchewan they have looked after matters pretty well themselves.

I might mention the equipment that is required for the locomotives. I have a few blue prints here that show the style of netting that is placed on the locomotives to prevent the escape of sparks. In the old diamond stack, the netting was at the top of the stack. In most of the engines that are used to-day, there is an extension front which is a receptacle for cinders. The cinders come in through the boiler pipes, are deflected downward by the baffle plate, and are then thrown up against a netting, and anything that is larger than the opening of the mesh is thrown back. That is the actual size of the mesh that is required to be used under the regulations of the Railway Commission, a No. 10 gauge wire. There have been various attempts to get some sort of apparatus on the top of the smokestack that would stop the sparks from getting out, but I do not think that any of them has been very successful.

I think that on the whole, the officials of the railway company are anxious that care should be taken, that these locomotives should be kept in proper order, but, of course, there are difficulties in steaming which certainly must affect the engine to a certain extent on up grades. And then screens will get out of order; they get worn out. With the locomotives such as we have now, a screen even with wire of that gauge will not last very long. Therefore, unless they are carefully looked after, they are almost certain to throw fire—in fact, we know from the evidence of our rangers that there is trouble along every line of railway just in that way, the throwing of fire from locomotives. For that reason, I suggest that our rangers should be authorized to act as agents of the Railway Commission. Let me give you an example of how that will work. One of our rangers sees a locomotive going along that is throwing fire. That locomotive may or may not be in condition. The probability is that it is not in condition, but he cannot do anything about it. The locomotive goes on to the sectional point, and if we could so arrange it that our men at the sectional point had authority from the Railway Commission to go in and examine any locomotive at any time he liked, the ranger who might observe a locomotive throwing fire could telegraph to his colleague at the sectional point, and have that locomotive examined as soon as it got in. In that way we could follow the railway companies up, and be sure that their locomotives were in order all the time. Unless the matter is followed up, we will certainly find they will not be in the best order.

By Mr. Molloy:

Q. Do you not think that in the case of a prosecution the fire rangers, or at least some of them, should have the power to act as magistrates. The distances they have to convey witnesses in some cases is very great and the journey is very expensive. If the fire ranger had the power of a magistrate, it would save time and save expense?—A. It certainly would. It would assist the men considerably if they had that power. But in the north country, where we have not got the service thoroughly organized, our rangers are only employed temporarily during the dangerous season, and it would give a man large powers to appoint him a magistrate. He would not only have a right to arrest offenders, but to try them and everything else.

By Hon. Mr. Fisher:

Q. Would there be any use in having your chief rangers appointed magistrates?—A. I think the chief rangers ought to be magistrates, at least for that purpose.

Q. They would have to be appointed by the provincial authorities in each province?—A. Yes.

Q. About how large an extent of country do you think a fire ranger can properly cover to be effective?—A. Of course, it depends a little upon the danger and the facilities for getting around. I really think that under ordinary circumstances, excepting, of course, in a very dry season, that a man ought to be able to patrol, say a hundred square miles and do it effectively. But I do not think we can get down to as small an area as that generally. In the case of forest reserves, where we can work most effectively, if a man has an average of 30 or 40 miles along the front of the reserve, and then a depth back into it of perhaps 30 miles or so, he may be able to handle it in ordinary times. In a dangerous season, or when special circumstances present themselves, it would be necessary to give him assistance.

By the Chairman:

Q. What is the position, Mr. Campbell, along the lines of railway, not going through Dominion territory, but provincial territory, that have been constructed? For instance, on the Canadian Pacific line between here and Port Arthur, have you anything to do with that? Do you take any account of it at all?—A. No, we have no authority or responsibility in connection with that at all, that is as far as our Branch is concerned.

Q. You have no duty resting on you to make any recommendations about it?—A. I would not feel that we had. I think that Ontario would consider that we were probably going beyond our duty a little, if we did attempt to make any recommendation in regard to it. The proposals that I make for our own territory, I think, apply—

Q. Yes, but the railway has a Dominion charter and the province of Ontario has no jurisdiction over the right of way of the railway. I was up through that country a few days ago, and one cannot help noticing that for hundreds of miles the right of way is loaded with what is neither more nor less than tinder. It is heaped with dry poles, and partially decayed trees, young trees. The fire has run through them and killed the roots of these trees, and they have tumbled over each other and accumulated. It is just like a pile of tinder and a spark thrown on the pile would send a fire through the whole country. I do not suppose the province of Ontario has jurisdiction to deal with it at all, and no doubt it would be beyond the duty of the Forestry Branch to make any regulations; but it seems to me that it might be very well considered that you should give it some attention, and ascertain what can be done to improve the condition of affairs, because a spark from an engine anywhere along that line of railway on a dry day in the fall would make a fire that a hundred men could not put out?—A. Yes, I noticed particularly when I was coming down last fall along that line, that there were fires burning everywhere.

Q. Where was that?—A. Along the line from Port Arthur to Ottawa.

Q. You say there were fires along the line?—A. There were fires running out from the line of railway, and it was quite clear that they had started from the railway itself, because the line of fire invariably ran away from the line of railway. Consequently, I think locomotives were responsible for starting these fires to a very great extent. One experience which I had myself demonstrates that quite clearly. The Canadian Pacific Railway had several trestles burned last summer up in that district, and as a general rule the newspaper reports said it was forest fires that did it. When I was coming down the line, I unfortunately had to stop off for a while at a small station just this side of Mattawa. We were not in the station more than half an hour when a boy came along and said he had just put out a fire on the trestle. That trestle was within half a mile of the station, and the locomotive of our own train, which had just passed over it, must unquestionably have started the fire; I don't think there is any doubt about it.

Q. I have observed for years, on the stretch of line referred to, that there is an accumulation of stuff which amounts to nothing more or less than tinder. It is the most combustible stuff which can be imagined, consisting of young spruce trees which

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had been killed by fire and have tumbled over and are there heaped up. There is also an accumulation of dry grass. Most of the water, that formerly lay there, has been carried off by the drains that have been built alongside the railway, and the mass of vegetation there has become absolutely dry. It seems to me that there will be absolutely no possibility of protecting that country from fire, unless in some way, that combustible material is removed from the right of way within a reasonable distance on both sides of the track. It seems to me that possibly the better way to get rid of this material would be to burn it. What do you think of that idea?—A. Yes, the best way to clear that right of way is to burn the material. Burning, of course, has to be done very carefully; otherwise it may do more damage than good. That is one reason why I always feel a little uncertain about recommending the use of fire, because, while a good thing, if it is handled carelessly, it becomes very dangerous.

By Hon. Mr. Fisher:

Q. Could not that burning take place in the spring and fall when there is moisture about? Although it would be a little more difficult to burn the debris then, there would be no danger of the fire spreading?—A. It would be better to do it at some time like that. I think the best thing, if we had a mature forest, would be for that forest to come up to the right of way, and have the right of way clear. I do not think that it would be advisable to try and clear back.

By the Chairman:

Q. The clearing now is pretty wide, do you know how wide?—A. I do not know exactly.

Q. It is much wider than it used to be up there?—A. There is a certain danger involved in dealing with that. If you have mature forests standing, there is less danger of a fire starting than when you have debris.

By Mr. Magrath:

Q. The fire is then confined to the right of way, is it not?—A. Yes.

Mr. MAGRATH.—The right of way as a rule is about 99 feet. It appears to me the same difficulty exists here that was met with in the Territories when we had prairie fires there. The legislatures compelled the railway companies to make fire guards on the right of way, which would then be only about 50 feet on either side, so that if a locomotive throws fire, the wind is likely to carry it outside of the right of way. So it appears to me that if the fire gets away at all, the wind is going to carry that fire.

By the Chairman:

Q. As a matter of fact, what is the usual thing that happens in case of fire being thrown from the smokestack of a locomotive? Does it fall a considerable distance away or close up?—A. The sparks fall fairly close, they do not go very far, as a rule.

By Hon. Mr. Fisher:

Q. They often carry more than 50 feet?—A. A spark will carry more than 50 feet, but not very much farther, that is, a spark that would be likely to set a fire. The matter has not been very carefully investigated. Some investigation has been made in the adjoining republic by one of the universities in regard to the question as to how far sparks would carry, and what damage they would do after they fell. They did not find that the sparks that carry for any long distance seemed likely to start a fire, but those that fell fairly close to the train would be likely to have that effect.

By Mr. Magrath:

Q. In the case of the prairie fires in the west, the only solution was making the guards about 300 feet from the railway. That is done now, and we have not suffered

to nearly the same extent?—A. Yes, you have an open country there and a strong wind on the prairie.

By Mr. Molloy:

Q. A fire taking place along a line of railway does, as a rule, come pretty close to the right of way even on the prairie?—A. As a rule it comes in pretty close. That is the conclusion come to as far as any investigation has been made.

Hon. Mr. FISHER.—It seems to me, Mr. Chairman, that in regard to cleaning up the right of way, the proper course would be for this Committee to make a recommendation to the Railway Commission to issue an order if we wish to take any practical action.

The CHAIRMAN.—That is why I am trying to get at the information. I regard the question of the protection of the forest from fire through these northern districts like those, for instance, around Port Arthur on the Canadian Pacific Railway as one of the most important things that can be considered. That whole country has been burned. It used to be a magnificent forest; there was an immense amount of valuable timber there, but there is practically none now, after you get past North Bay. You will find patches here and there, but the great stretches of timber that used to exist through that country do not now exist at all; they are all burned up. Now the whole country is reforesting itself. If you are travelling on the Canadian Pacific Railway and look out of the windows of the car, you will see that for miles the jack pines are growing. In mile after mile of that country they are standing 12 or 15 feet high. If they can be protected and fire kept out of that territory effectively, in twenty years that will be a forest country again, because the jack pine grows very fast and the country is very well adapted for it. While the jack pine is not as good timber as the white pine, it is very valuable and will be getting more valuable as time goes on. For instance, take the question of railway ties. They are worth from 50 to 60 cents, and the jack pine makes a good railway tie. The Ontario government is doing a good deal, but what I am trying to get at—and I think it is accurate and represents the real fact—is this: that to a certain extent the thing is falling between two stools. The Canadian Pacific Railway is a Dominion railway over which the province of Ontario has no jurisdiction as to its operation or right of way. But it is an Ontario forest, and Mr. Campbell's idea was that because of that fact he had nothing to do with it. When Ontario comes to deal with the matter, its jurisdiction is also limited by the fact that it cannot control the railway. Therefore, I think we ought to get at the true facts of the case, and see whether they cannot be effectively dealt with so as to strengthen the hands of the province of Ontario in the matter of forest protection.

Hon. Mr. FISHER.—My suggested idea was this, that as affects the right of way, the matter comes under the jurisdiction of the Railway Commission, and that body can issue an order in regard to the clearing up of the right of way of railroads as well as they can issue an order in regard to anything else under the Railway Act. Therefore, if this Committee were to pass a resolution, and it should pass the House in a report from us, that would be an instruction to the Commission to take certain steps. I am not sure whether that procedure would be the best, but that is what strikes me.

The CHAIRMAN.—I think the Committee would have to get the facts pretty fully before we committed ourselves to passing a resolution.

Hon. Mr. FISHER.—Yes.

The CHAIRMAN.—We ought to hear, I think, what the province of Ontario is doing. We have had a very much improved fire ranging service of late, and they have improved their fire ranging service very much indeed. We should hear what their people are doing, and I have no doubt their chief ranger would be glad to come and discuss the matter with the Committee, the object being to strengthen the hands of the provincial authorities, and see if we can do something to make the conditions better.

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Hon. Mr. FISHER.—If the right of way of the railroad is outside of their jurisdiction and under the control of the Dominion Parliament, we would have to take action through the latter body.

The CHAIRMAN.—No doubt.

Mr. CAMPBELL.—The question of supervision arises after you have settled that of jurisdiction. The trouble is that we have often had good laws, but we have not had any way of enforcing them properly.

The CHAIRMAN.—I have no doubt it would be a matter for the Forestry Department of Ontario to have supervision of the work, because it affects directly their territory and the forests which they own; but it would be a very proper thing for the Forestry Branch of this Government to inform itself as to the facts and so assist the Railway Commission in dealing with the question.

Hon. Mr. FISHER.—This Committee and the Railway Commission would have to look to our Forestry Branch for the information and the arguments on which to base an order of that kind.

By Mr. Magrath:

Q. As to forest ranging, while the expenditure for that work is so very limited, is it desirable to expend a considerable portion of that money in forest ranging in the far interior, where there is a very small proportion of people going and leaving the territory in which railways are being constructed practically unattended to? I mean to say, take our whole forestry force, if they were put to work upon railways that are being constructed in the west, along those railways where there is the very greatest possible danger from fire, is it not probable that more could be done towards saving our timber?—A. There is no doubt, the greatest danger arises when a railway goes through the country. That has been our experience all the time. We had a little examination made of the Crow's Nest district last summer, and the result went to show that some of the worst fires we had in that valley occurred when the railway went through. We lost a lot of timber there. There is no question whatever that the greatest danger exists along the line of railways.

Q. Especially during construction?—A. Yes, where construction is going on, and that ought to be watched. If we do not watch that, there is no use in our doing anything else. At the same time, it will not do for us to let the rest of the country go by any means. If the Government are going to carry out this work effectively they have got to spend a little more money; that is all there is to it. At the same time, it will not do for us to take the men off the districts in the north. Look at the extent of the north country. If we did not have our rangers patrolling it, we would almost certainly have destructive fires there. Our rangers have done good work within the last few years; we have not really had any bad fires on Dominion territory, except the two or three that I mentioned that got away from us and destroyed considerable areas of timber. Unless we watch those routes of travel, serious fires will occur, and we cannot afford to lose any timber now.

Q. Are we not likely to lose more timber along the railways that are being constructed?—A. Yes.

Q. Then surely we should watch that territory more closely than we should the interior, where there is a very small population going in that is likely to set out fires?—A. Yes, but still from my point of view it is a bad thing to leave the other part of the country unprotected. We ought to provide for both. I urge as strongly as possible that wherever lines of construction are going on we ought to put a special force on. That ought to be done in the case of every line that is being constructed into that northern district where there is any forest at all; but I do not think that in order to do so, we should remove the men from the other routes, because we have very few men there considering the extent of the country they have to cover. If we do less than we are doing now, we might as well frankly admit that we are not doing anything, and not make the pretense of fire ranging.

By Mr. Molloy:

Q. How many men did you say are now employed by the Dominion government in fire ranging?—A. We have 82 men employed as fire rangers.

Q. In the north country alone?—A. No, in the north country we had last year altogether 35.

Q. Can you tell us approximately how many miles each man has to travel per month in the performance of his duties?—A. If you take the country along the Athabasca River, the fire ranger there has a patrol of about 200 miles, that is, he has to go down and come back along that river. The man in the district along the line of the Grand Trunk Pacific near Edmonton has to cover about 50 or 60 miles.

Q. Back and forth?—A. Yes.

Q. Would that be too much for one man?—A. It is rather too much. It is a question of getting enough money to handle the problem. If we had money enough we could put on sufficient men to perform the work efficiently.

By Mr. Magrath:

Q. I judge that the work of the fire rangers is not so much preventive as it is educative, teaching the people not to set out fires?—A. That is one of the main things. One of the best factors in their work is getting the people interested in the question of saving the timber and training them to put their fires out, and when they are using a fire to handle it carefully. That is one of the best pieces of work that the fire rangers do, and I think that the result along the lines patrolled by them in preventing fires has been accomplished largely by the fact that people are much more careful and work directly with the rangers in extinguishing fires. In fact, I know that is the case.

By Mr. Perley:

Q. What is being done to prevent fires along the Transcontinental Railway where there is timber, is anything being done in that line?—A. That is under the provincial authorities, we have not done anything.

Q. The Dominion Government is building this railway through the northern parts of Ontario and Quebec, and no one else can protect that timber. It is up to the Dominion Government to act?—A. Of course, matters in connection with that would come under the Transcontinental Railway Commission. I do not think that we as a Forestry Branch would have any jurisdiction in the matter.

Q. Have you any information on the subject? Do you know whether or not anything is being done in that regard?—A. Yes, in the first place, the Commission make regulations in connection with the arrangements with their contractors in regard to this matter. This is a provision which is embodied in their specifications in regard to damage by fire:

Special precautions must be taken by the contractor at his own expense to prevent fire; and the labourers in his employ shall be subject to the direction of the engineer in the event of their aid being required by the engineer to extinguish forest fires occurring in proximity to the right of way.

The contractor shall conform to the fire regulations adopted by the Commissioners and also to the laws and regulations respecting fires in the different provinces wherein the work is being performed.

Any damage by fire that may occur to buildings or structures during construction, may be made good by the contractor who must keep such structures fully insured until the same have been completed and accepted by the Commissioners.

And so on. Then the specifications go on to say:

The whole, or as much of the right of way as the engineer may direct, shall be entirely cleared of all trees, logs, brush and other perishable matter; all of which shall be burnt or otherwise disposed of as the engineer may direct, unless specially reserved,

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to be made into ties, timber or cordwood. All merchantable timber, &c., cut on the right of way will belong to the Commissioners who may dispose of same as best seems fit. Unless directed in writing by the engineer, trees and brush must not be thrown on adjacent lands, but must be disposed of on the right of way. Trees unavoidably falling outside of the right of way must be cut up, removed to right of way and disposed of.'

Then in regard to wooden structures:

'Before commencing work on any wooden structure, the ground must be entirely clear of logs, brush and trees for the whole of the width of the right of way, and during the progress of the work all pile or timber ends, chips and brush, shall be cleared from around the structures and burnt, or otherwise disposed of as the engineer may direct.'

Q. These are very good regulations; but as you said before, we have good laws that are not enforced. There has not been a railroad built in this country yet that has not burnt up all the timber around it, and I would like to see the Dominion set the good example of building a railroad without burning up the timber. It seems to me this is the most important question of this nature that is before us at the present moment, the most imperative question?—A. I think it is.

By the Chairman:

Q. Do you know what the provincial governments are doing along the line of construction of the Grand Trunk Pacific?—A. The Ontario Government sent out a number of rangers, and I think the Quebec Government did also, but I am not very sure. I know that in New Brunswick, they paid special attention to this matter. I did not think that the Dominion Forestry Branch had jurisdiction, but the subject was considered by the Forestry Association, and we passed rather strong resolutions particularly directed to that matter, and transmitted them to all the governments concerned, and I think they have had some effect. I think it was after we sent resolutions to the Railway Commission, that the regulations were framed with these special provisions.

Mr. PERLEY.—I think it would be well if the Chairman would see the Railway Commission and have them enforce the regulations.

The CHAIRMAN.—It would be a good idea. There is just a possibility that in a case like this, where there are so many jurisdictions, one body may claim it is the business of another body, and there may be a disposition, if anything happens, to throw the responsibility on somebody else. We might possibly perform a useful function by getting to the bottom of the matter, and making a recommendation that would cover the case.

Mr. CAMPBELL.—The question of clearing the right of way not only on the Trans-continental, but on some of the other lines has already arisen, and particularly in New Brunswick. The Deputy Surveyor General of New Brunswick attended the meeting of the Forestry Association, and drew attention to the fact, that along the line of the Intercolonial, the right of way was not kept very well cleared. The Forestry Association passed a resolution and transmitted it to the Government at that time in regard to that right of way. But as far as the Forestry Branch is concerned, we always felt that we had no direct jurisdiction, and when we wanted to call attention to anything like that, it was done through the Forestry Association.

The CHAIRMAN.—You can do it through this Committee now, Mr. Campbell. You have a better opportunity of getting to work.

Mr. CAMPBELL.—It is a good thing to have as much support as possible.

By Mr. Magrath:

Q. How much money is placed at your disposal for this work?—A. For fire ranging?

Q. Yes, or for forestry purposes?—A. The appropriation for the Forestry Branch is about \$100,000. We have spent about \$50,000 on fire ranging.

Q. In the United States what do they spend annually in connection with forestry work?—A. There the appropriation is \$4,640,000 for the forest service.

Q. And do the individual states perform their own ranging?—A. Yes.

Q. So that the \$4,000,000 does not represent the entire amount of money expended on forestry work in the United States?—A. No.

By the Chairman:

Q. That is all spent on federal properties, is it not?—A. Yes, on federal property.

By Mr. Béland:

Q. For all forestry purposes and not merely for fire protection?—A. Yes, for all forestry purposes. The United States have taken up a great many lines of investigation that we have not yet been able to touch at all.

THE CHAIRMAN.—The point Mr. Magrath has in mind, I think, is covered by this: this money is expended for the administration of the forest reserves.

MR. MAGRATH.—The four millions?

THE CHAIRMAN.—It is expended on forest lands owned by the United States and on nothing else. They do not carry on any general system of fire protection.

By Mr. Magrath:

Q. As against that \$4,640,000 we spend \$100,000?—A. Yes.

THE CHAIRMAN.—And our work is rather more general than theirs, because the rangers sometimes go outside of the places where there is any Dominion forest to protect timber.

FOREST RESERVES.

MR. CAMPBELL.—Another branch of the subject is that of forest reserves, and these, under Dominion jurisdiction in the western provinces, number 26. The total area within the reserves is 10,600,000 acres. That includes what are generally described as Dominion parks. Those are Rocky Mountain Park, Yoho Park, and so on. They come under the jurisdiction of the Forestry Branch as well as what are technically designated 'Forest Reserves.' Most of them were finally set apart by the Forest Reserve Act of 1896. Previous to that they were only established by order of the Minister or by Order in Council. Now they are established by Act of Parliament, and lands can only be withdrawn from them by Dominion statute. As far as they have been established, they have been put on a pretty permanent basis. We made examinations of several districts last summer to see if there should be any additions made, and we recommended an extension of the Spruce Woods reserve in Manitoba. This is all sandy country, and we recommended that the extension should take in a considerable area that is of the same character and not good agricultural land. In the Prince Albert district, we had the Pines reserve looked over, and recommended some additions to take in a sandy tract north of the North Saskatchewan river, which is merely an extension of the sandy district to the south. The Beaver Hills in Saskatchewan were inspected, and we recommended that a township there should be included. Not only is it established as a forest reserve, but the Provincial Government is anxious that it should be held as a preserve for beaver. We made an examination of the Cypress Hills district. There is only half a township reserved in the Cypress Hills, but there is a fair amount of good timber, some spruce, and some lodgepole pine. It is a very important watershed. We had that examined and recommended that 192 square miles be added to it.

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By the Chairman:

Q. Is all that land available?—A. There is some of it that is not in Dominion hands entirely, we have not added it yet. We are going into that question before finally deciding about what is to be taken in.

Q. That is down here?—A. Yes. We have had it provisionally reserved until we can look further into that part of the question.

Q. What is the area of the reserves here?—A. Riding Mountain reserve contains about 1,500 square miles, and Duck Mountain about 1,200 square miles. The Porcupine reserve contains about 600 square miles. In regard to the general question of forest reserves I have prepared some notes. I had better read them, and then we can consider any other matters that may be brought up. The policy and location of forest reserves is determined by the following considerations:—

1. The necessity for the devotion to forest of lands not suited for agriculture.
2. The protection of watersheds.
3. The protection of fish and game.
4. The furnishing of pleasure resorts for the public.
5. The locating of the forest problems in defined and restricted places where advanced methods of forest management may be tried, and where experimental work in reforestation may be done.

It is believed that these considerations present a powerful and complete argument for the establishment of forest reserves, and in the setting apart of the Dominion reserves in each case, most or all, of these considerations have been the moving cause.

It is not intended that the reserves shall be closed in such a way that their resources shall not be available for use, but that they shall be so regulated that they may be preserved by wise use. Regulations have been established for the cutting of timber, the use of the hay, and proposals have been submitted for the use of the shores of lakes and other bodies of water as summer resorts.

The regulations in regard to the cutting of timber provide that trees cut for lumber must be ten inches in diameter or over, that the cutting shall be done under control of the officer in charge of the reserve, that all unnecessary waste or destruction of timber shall be avoided, and all parts exceeding four inches in diameter of trees cut down shall be removed. The dues are so adjusted as to encourage the cutting of the least valuable and more plentiful species, such as poplar, by making a higher rate for the more valuable species.

As the reserves in the west are expected and intended to meet local demands, the regulations provide for the disposal of timber to settlers only under permit, and this privilege is confined at present to an area within 50 miles surrounding the reserves.

One of the chief difficulties in dealing with the forest reserves has resulted from the squatters located thereon. Steps are being taken for their removal and have been carried out successfully on the Riding Mountain, Turtle Mountain, Moose Mountain and other reserves. One hundred and twenty-six squatters were removed from the Riding Mountain reserve, and twenty-five from the Turtle Mountain reserve. These squatters have all been settled elsewhere quietly and have expressed themselves as well satisfied.

The boundaries of the reserves are being defined by the cutting out of the lines and marking them with special posts, so that there may be no excuse for not knowing the boundaries.

Timber surveys are being carried on in the reserves so as to determine their resources, and these will give data sufficiently accurate to plot out the timber areas by species and conditions, so as to determine with all necessary accuracy the topography and the stand of timber.

These surveys show that the reserves have suffered from fires and careless cutting, and will need careful treatment to bring them into good producing condition again.

The management of the reserves is provided for by the following organizations:—

1. A staff of permanent rangers.

2. Technical officers, who are graduates of forest schools, to make the timber surveys, lay out plans of management for cutting timber and improving the condition of the reserve, and over-see the carrying out of the plans. There are two permanent officers of this character, Mr. H. R. MacMillan, a graduate of the Yale Forest School, and Mr. J. R. Dickson, a graduate of the Forest School of the University of Michigan. These gentlemen are both Canadians, but they had to go to the United States for their forestry education.

3. An inspector of forest reserves. This position is held by Mr. A. Knechtel, a graduate in Forestry of Cornell Forest School, and for seven years Forester for the Forest, Fish and Game Commission of the state of New York. This gentleman is also a Canadian, although he was in New York state for some time and took his forestry course there. His duties are the general inspection of the reserves, the staff and the officers in connection therewith, the direction of timber surveys, and final supervision of the organization and plans of management.

REFORESTATION.

On the reserves we have made some experiments in reforestation on a very small scale. It has not been possible to do very much. We have tried the two methods of sowing the seed and planting. The planting has not amounted to very much yet. That is, we have only planted 25 acres, so it is merely an experiment to find out how it will succeed. The planting we have tried has done very well where two year seedlings were used. We tried three-year seedlings also, but they did not do as well as the others. We found that it worked out about in this way; that the cost of the seedlings grown in our own nursery at Indian Head was about 75 cents a thousand, and planting them as we do, about 4 feet apart, which would require 2,700 to the acre, would cost about \$2.03 for the stock to plant an acre. The cost of planting per acre would be about \$5. The total cost per acre of planting, so far as our present experiments go, would be about \$7. As to how far planting will be necessary on the reserves is a question, that will have to be worked out. As far as we can make out now, there are open places where planting will have to be done. In the open places, we have found that seeding is not satisfactory, and we will probably have to resort to planting in some cases.

We have made some experiments in seeding, and it is a cheaper method. There are several ways of getting the seed into the ground. It may be scattered broadcast, which is, of course, very much more easily and cheaply done than by a more careful method, but the chances for loss of seed are very much greater. There is another method that has been used in the forests of Europe; that is to prepare, to a certain extent, the place where the seeding is to be done. The seed will not germinate properly, if it falls on leaves or brush or anything of that kind; it has got to get down to the mineral soil in order to be sure of germination and striking the root properly. One man will go along and clear off the duff with a hoe or some such instrument, and the next man will go along and drop the seed in the place he has dug, and press it down lightly with his foot. Mr. Knechtel, who is in charge of our experimental work, tried that method in New York state and found it worked out very satisfactorily. We did a little experimentation last summer with a number of different species on the Turtle Mountain reserve and the Spruce Woods reserve. The attempt on the Spruce Woods reserve was not successful; we are not absolutely certain just what the difficulty was. On the Turtle Mountain reserve most of the experiments resulted fairly well. Our conclusion is that where there is a little shelter, sowing will do very well, but on the open ground such as we have in the Spruce Woods reserve, the conditions are different. It is a sandy tract, and it has been evidently burnt over pretty frequently, and the stand of timber is very thin.

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There is a good deal of open ground there, and the probability is that we will have to do considerable planting; we cannot depend upon the sowing there. We are going to continue these experiments in seeding. We had the forest rangers on the reserves last fall gather considerable quantities of the cones of spruce and jackpine, both the northern jackpine and the lodge-pole pine, and we are going to try some experiments this spring with seed to see how it will work out.

As I have stated already, the Dominion has throughout the country about ten and a half million acres in forest reserves, Ontario has 11,700,000 acres, and Quebec has nearly 106,000,000 acres. Quebec has reserved practically all of its forest lands. These figures give a total for the whole Dominion of 128,000,000 acres. None of the other provinces have formed forest reserves.

By the Chairman:

Q. Is that land in Quebec in reserves?—A. Yes, these are the Quebec reserves. They practically cover all the forest lands in Quebec. These are the Ontario reserves. (Indicating the map). This Temagami reserve is a particularly fine one with a good stand of pine. I saw a proposal mentioned in the newspapers for an additional reserve in Ontario. I do not know whether the proposal has been carried out or not, but I placed the reserve on the map in order to show it.

Q. I think in the province of Ontario they have been following the policy of making the reserves where there was good merchantable timber?—A. Yes, as a rule.

Q. They do not seem to have had it directed to their attention that it would be desirable to reserve large territories, or large tracts of land, that are fit for forestry, and that are reforesting themselves now, where the timber is not merchantable at the present time?—A. They have a small reserve in Hastings county, down towards Lake Ontario, that is of that character. This country is not very well afforested around Lake Nipigon.

Q. They claim there is considerable valuable pine there?—A. There is considerable, but the country is not by any means all afforested. It was not purely on the question of the forest stand that they established that reserve.

Q. What is the area of these two reserves?—A. The Rocky Mountains Park reserve has an area of about 4,500 square miles, and the Jasper Park about 5,000 square miles.

Q. Did you have any serious fires in these parks last year?—A. Yes, we had that bad one I mentioned on the Spray River.

By Mr. Magrath:

Q. Have you any reserve in the Crow's Nest region?—A. No, we have no regular reserve. The only thing in the nature of a reserve that we have in the Crow's Nest country is a departmental order that lands in that district within a township north and south, were not to be entered without a previous inspection.

By the Chairman:

Q. Is there any reason why all of this land on the slope, so far as is now under the control of the Federal Government, should not be included in these reserves?—A. No reason that I know of.

By Mr. Magrath:

Q. I think there is the very best reason that they should be?—A. That would be my judgment on it.

By the Chairman:

Q. How much of the land down here is within the control of the Federal Government?—A. It is pretty much all within the control of the Government, as much as these parks are.

Q. What about this land?—A. That is in the same way. Of course, there are timber licenses on a considerable part of it.

Q. That does not interfere in any way with your control?—A. That does not interfere with our control. They are under annual license and subject to the regulations that are contained in the license. I was going to refer to our control of the licensees a little later on.

Q. I understand there has been great destruction by fires up here, between the Crow's Nest and the mainland of the Canadian Pacific Railway, is that correct?—A. Yes, there has been considerable. Of course, it is not as bad as it is in a place like the Crow's Nest Pass, for instance, where the railways have gone through, but there has been considerable. We have not made a careful examination of that country, and our information about it is very general. This examination of the Crow's Nest Pass was the beginning of what I hope to do along the whole of that slope. I do not think we will be able to make any further examination this year, because we have not got enough money or enough qualified men. What I propose is to work north and south, and gradually get the whole district mapped out.

This is the Pines reserve near Prince Albert, which we examined last year. It is a very small reserve and the examination did not take very long. What we propose is to have surveys carried out on all the reserves and have them mapped out in that style; so that we will be able to tell just what we have there, and know what we are doing when we are dealing with it. These surveys have been carried on for the last few years.

Mr. MAGRATH.—There was hardly a summer, Mr. Chairman—I am speaking now of a few years ago—but what we would see in midsummer in that country dense volumes of smoke coming out of the mountains. We have been accustomed to accuse the railway companies of causing the fires, but I remember that in 1882, before the railway was in there, I was precluded from working for about a week from the same cause. So there are other causes than the railways for the setting of these fires.

Mr. CAMPBELL.—Undoubtedly.

By the Chairman:

Q. On what point have you got any method of controlling or keeping track of people that go prospecting into the forest reserves?—A. Well, we have the regulations, and as far as we can, we enforce them. We try to keep track of such people.

Q. Do you not make them come to you and take out a special permit?—A. For prospecting? Yes.

Q. On a reserve?—A. Yes.

Q. Then, of course, if a man has to come and get a permit to enter certain places you can follow him up pretty well?—A. Yes.

Q. If a fire occurs there, you know pretty well who is responsible. That is a great protection if it is rigidly enforced, and that to my mind is one of the main reasons for extending the reserves; it puts the department in a position to absolutely prevent anybody going on a reserve without coming and getting a permit, and having his operations confined to the particular district where he went in, so that the warden of the territory will know that he is there, and what he is doing. There is not much danger of a fire if the man knows that he is watched, and the officers know where he is. He is more likely to be careful than an individual who just goes off to the woods without anybody knowing where he is; such a chap does not take very much trouble.

By Mr. Magrath:

Q. The Crow's Nest Railway has always been accused of setting the fires in that district. There have probably been millions of dollars of damage done in that pass. A little to the south of it there is the North Kootenay pass and then South Kootenay or Boundary pass. Both should be taken in?—A. Undoubtedly there were fires in that

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district before the railway went through. The railway is not wholly responsible. Prospectors are certainly responsible for a good many of the fires that we have had there. There is no doubt about that and at the present time there is a danger from prospectors. Of course, we have been speaking of railways particularly, but they are not the only offenders by any means.

By Mr. Molloy:

Q. What fine is imposed when anybody is prosecuted and found guilty?—A. That depends upon the province. The fine runs from \$25 up to \$100 and \$200. When a prosecution is carried out, you generally find that the minimum fine is imposed, about \$25. In some cases in British Columbia, they thought \$25 as too heavy a fine, and in spite of the law they reduced it to about \$5.

WATER SUPPLY.

By the Chairman:

Q. Have you got any information that you can give us in regard to the water supply in this territory here extending to the plains?—A. Yes. I may say that measurements of the water supply were started about the year 1894, and they were carried on for two or three years until Mr. Dennis who was then in charge, got a working basis on which to handle the irrigation applications. Since that time they have not been carried out very thoroughly, and it is only within the last year that I have got the work started again on a proper basis. This year, we are reorganizing the work of stream measurements, and separating it to a certain extent from the general inspection work, so that it can be carried out with reference to itself alone. In the past, measurements have been carried on every summer in such a way that while a man is out inspecting all these different irrigation schemes shown on this plan, he could, at the same time, take measurements of water. The result was he could not obtain the measurements when they should be taken, and the results were uncertain and scattered. It takes eight or ten years' steady measurements at proper times to get a really adequate idea of what the stream flow is, and we have organized it in this way now: there will be a man in charge of the Calgary district who will look after the measurements there. There will be another one for the Lethbridge district, and a third for the Cypress Hills district. We expect that carrying on the work in that way, we will be able to get a reliable idea of what the flow is. Now, as regards Mr. Dennis' conclusions on the preliminary work that he had done so as to determine the general quantities, I may say that under the Irrigation Act the flow of the rivers has been considered in three stages—that is low water, high water and flood water. The low water flow of the streams in the district was calculated by Mr. Dennis at 7,403 cubic feet per second, the high water flow at 89,758 cubic feet and the flood flow at 264,364 cubic feet. As you will notice, there is great variation in the flow of water in these rivers, because they are subject to frequent floods. These figures relate to the flow from the eastern slope of the Rocky Mountains. That is practically all the information we have that can be given.

Q. What territory does that include?—A. That runs from the International boundary up to the Red Deer river just north from Calgary. We have no gauging of the rivers north of that. Speaking of the main rivers, in the Bow river the low water flow is estimated at 2,779 cubic feet, the high water flow at 26,224 cubic feet, and the flood flow at 41,945 cubic feet. The main rivers are the Red Deer, Bow, Little Bow, Highwood, Old Man, Belly, Waterton, St. Mary and Milk. The St. Mary's and Milk rivers have their sources in the United States, and we do not control their head waters. The head waters of the rest we do control. They all rise on the eastern slopes of the Rocky Mountains, and there is no doubt whatever that the question of the water supply and the protection of the forest along these slopes are closely connected. In regard to the development in irrigation which has taken place

in that country, I might give you the figures as to the number of schemes that have been carried out under the Irrigation Act. In Alberta, 118 schemes have been licensed, and in Saskatchewan 42, a total of 160. At present there are 71 schemes authorized in Alberta and 84 in Saskatchewan, a total of 155, and there are 25 applications now before the department which have not been authorized nor licensed. These figures give a total of 340. The area to be irrigated by all these schemes is 3,000,000 acres in Alberta and 47,000 acres in Saskatchewan. The Canadian Pacific Railway Company control a tract of 3,000,000 acres east of Calgary, for which they obtain water from Bow river. The Alberta Railway and Irrigation Company, with headquarters at Lethbridge, which is the pioneer irrigation company in the west, is irrigating a portion of the railway land grant with water from St. Mary's river. In addition, the company was allowed to purchase, in connection with its irrigation work, a tract of 500,000 acres. None of these irrigation schemes are completed as yet. A tract of 380,000 acres is under contract of sale to the Southern Alberta Land Company. The water is to be brought by canal from up the Bow river here, thrown into a reservoir in the Snake valley, and used on lands west from Medicine Hat. These are the large schemes. In these districts it is necessary to have fairly large capital, because the rivers are in low valleys and to get the water on these lands is expensive, and requires considerable financial resources. It is not a case for individual effort at all.

In the Cypress Hills district, as you will see, there are a very large number of small schemes. This is a development that has come almost entirely in the last few years. There are a large number of people going in there to operate small ranches who want tracts on which they can raise feed for cattle and sheep ranching on the lands. I think the developments in the country around Cypress Hills will be in the direction of small ranching with an irrigated tract to make a sure crop of fodder for the stock.

To give you an idea as to the relation between the large and small streams, I might mention that there are four large schemes constructed by companies. 15 smaller schemes, comprising over 1,280 acres each; 27 schemes comprising from 640 to 1,280 acres each and 294 schemes comprising less than 640 acres each, a total of 340 schemes. In addition to irrigation schemes there are industrial, domestic and other schemes, of which 131 have been licensed, 72 authorized, and 19 applications received. The industrial schemes are mostly for supplying the railways. In the irrigation district, the riparian rights or any of private ownership in the water have been done away with. They are all vested in the Government, and any rights to use the water, except for ordinary domestic purposes, has to be obtained by license. There are a number of schemes classed under the heading of 'other' schemes numbering 26 in all. Most of these are municipal water supply schemes. I believe that one of the most important necessities in that district will be found to be the water supply for municipalities with what is used for other domestic purposes.

I have a general statement here in regard to the matter, but perhaps it is not necessary for me to read as the time is going on, but I could perhaps make one or two points. I have mentioned about the arrangement in regard to the hydrographic survey or the stream measurements, whichever you may choose to call it. We have to take a cross-section of each stream, and then gauge the rate at which the water is running at the different stages in order to know what the flow and volume are. There are several cross-sections here that were taken on the Milk River. We have the scheme well organized now so that we can take these measurements regularly. We will cover the streams in the irrigation districts thoroughly by another year at any rate, and I think that in a few years we will have some really reliable statistics. When we complete our arrangements in the irrigation districts, it is proposed to extend the measurements as rapidly as possible to all streams issuing from the forest reserves. All the watersheds in the west will finally be included in these reserves, and it is expected that the results will be of the greatest advantage to all the western provinces. Stations will be established at main points on all the large streams.

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Further, the observations of stream flows will be related to the observations of snowfall and rainfall, made by the Meteorological Bureau, and to those made by the officers of the forest service within the forest reserves. It is hoped that in this way reliable data will be obtained as to the influence of forests on precipitation and run-off, a much debated question. Such a combination of observations should give information of the utmost value to municipalities contemplating the establishment of water supply systems or works for light or power schemes, to industrial development generally, to irrigation projects, and perhaps also to navigation. I consider it a very important matter to find out what influence the forests have on precipitation or run-off, and I think by having our forest officers on these eastern slopes making observations, and having the measurements taken on the streams below, and the observations of the Meteorological Bureau in regard to precipitation, we ought to be able to work out information that will not only be useful in that particular district, but in the general interest from a scientific point of view as well.

While it is advisable to preserve the forests and find out what their influence is, there is no question whatever that if we are going to get the full use of the waters in these rivers, in time there will have to be artificial structures used, and dams will have to be built for the creation of reservoirs.

Q. Do you know anything about the possibility of making convenient reservoirs in the foot-hills?—A. We don't know very much about it; there has not been much examination made with that object in view. On the recommendation of Mr. Dennis, some years ago, some small reservoir sites were planned, but they were mainly down in the foot-hills. They merely affected small bodies of water. The general question of controlling the waters of a river, as for example, the Bow River, has not been worked out. This year there is to be an examination made of the upper parts of the Bow River, and also of the Waterton, and possibly of Cypress Lake, in the Cypress Hills. There is a possibility that Cypress Lake, on the southern side of the Cypress Hills, could be converted into a reservoir, which will mean the use of a large quantity of water that now goes to waste. The Surveyor General is to make an examination this year as a preliminary to see what can be done. In the United States they have gone thoroughly into that question by means of the reclamation service, and the Government themselves are building these dams and establishing these reservoirs. All we propose to do now is preliminary work to find out what the possibilities of storage are. The question as to how the storage is to be made or made use of has to be considered later.

Q. I should think that, in regard to these southern rivers, it might be possible. Of course, you could not do much with the Saskatchewan, it is too large, the flood waters on the Saskatchewan are enormous?—A. They are enormous. I do not know what could be done in that case, because we have not made any examination. I was talking to an engineer at Edmonton who had been up on the Brazeau and on the northern Saskatchewan, and he thought that in connection with a number of lakes there, there had at one time been a natural dam and he said he thought these lakes could be easily dammed again, and made to hold a large quantity of water. Of course, all the information we have is very slight. We could hardly say from the information we have what could be done, but it is a question that is worth looking into carefully. These floods come down very suddenly; in fact, any person that has had experience of these western streams knows how suddenly they come down. There was, for example, the flood at Edmonton on the northern Saskatchewan about two years ago. At that time one lumber firm lost two-thirds of their logs.

Q. Do you happen to remember what the average rise was, at Edmonton, two years ago, when they had their high water; it must have been about 30 feet?—A. It was about that.

The CHAIRMAN.—How wide is the river there, Mr. Magrath? It is nearly a thousand feet, is it not?

Mr. MAGRATH.—It is.

The CHAIRMAN.—And the water rose about 30 feet?

Mr. CAMPBELL.—That question is one that should be looked into and all the data possible obtained in regard to it.

The CHAIRMAN.—Then, we have to consider the extension of the reserves from the International boundary line northward to the Yellowhead pass. That is important, and then there is the procuring of information as to the possibility of storage reservoirs to regulate the flow of water, and the matter of the fire ranging service in the forest reserves. Is there anything else?

Mr. MAGRATH.—You are now touching a subject which is very close to me, and I want to have about 10 or 15 minutes, at some time, in connection with this very subject. While it is desirable and absolutely necessary for us to know what water supply we have got, there is other information that should go hand in hand with it. That is how can we place that water to the best advantage for the people in the country? Nothing has been done in that respect, and as the Committee will probably be making a recommendation later and its report will doubtless be considered most favourably by the Government, I would like to get my ideas well before the Committee, and if they think they are good, embody them in its report to the House.

The CHAIRMAN.—Of course, we will have to consider the evidence and our report very carefully. The reason I am mentioning these matters, especially now is to get them clearly in the minds of the members of the Committee so that they can be considered. We have to consider the evidence and the different recommendations that we should make, and that will be the time for each member of the Committee to state his views at length.

Q. Mr. Campbell, could these reserves in the neighbourhood of the Riding Mountain, and the Duck Mountain, be profitably extended, or are they sufficiently large now to protect the head waters of these streams?—**A.** I think that the Riding and Duck Mountain reserves are perhaps sufficiently large now, except that on the west side of the Duck Mountain there may be a little taken in. On the west side of that mountain there is territory that really should be in a reserve. We have not had it examined particularly, but there is land there that is more or less timbered.

Q. That is the source of all the streams that come down into Manitoba?—**A.** Yes, that is a very important watershed for Manitoba.

The CHAIRMAN.—Do the members of the Committee understand this point? This small reserve protects the head waters of all the streams that run down into the fertile part of Manitoba. The Assiniboine and its tributaries all come from there, and this reserve has been formed for the purpose of protecting the water supply. I was asking Mr. Campbell to say whether, in his judgment, the reserve was sufficiently large, or if it could be added to with advantage.

Mr. CAMPBELL.—I think the reserves probably serve the purpose pretty well. The only place where an addition might be made is on the west side of the Duck Mountain reserve. Then so far as the Porcupine reserve is concerned, a little addition might be made there. There are lands around that reserve that are afforested, not suited to agricultural purposes and which would protect the watershed to a certain extent. There are a number of districts up here that ought to be examined. For instance, there is the Pas district. There are a number of places where there should be additional reserves, but the trouble is to get to them. Now, shall I go on with my subject?

Mr. FOWKE.—I move that the Committee now adjourn.

The CHAIRMAN.—Have you had enough for to-day?

Mr. FOWKE.—We have had a very good lesson to-day.

The CHAIRMAN.—When shall we meet again?

Mr. FOWKE.—A week from to-day.

The CHAIRMAN.—The session is getting on, and we must meet oftener if we are going to do anything.

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Mr. FOWKE.—These addresses are very interesting, and I would like meeting oftener than once a week.

The CHAIRMAN.—I suggest then that we meet on Tuesday at half past ten. Is that agreeable?

Suggestion concurred in.

Committee adjourned.

HOUSE OF COMMONS, OTTAWA, April 20, 1909.

The Committee on Forests, Waterways and Water-powers met at 10.30 a.m., the Chairman, the Hon. Clifford Sifton, presiding.

Mr. CAMPBELL.—Before proceeding with the other divisions of the subject, I would like to mention one point in connection with the water supply which I overlooked the other day: that is, that so far as our present knowledge of the water is concerned, and the facilities we have for making use of it, we have pretty well taken up at the present time the water supply in the irrigation district. The present situation is not encouraging for further development of irrigated farming, outside the large tracts now being offered for sale by companies authorized to supply water for this purpose. The supply of water available for irrigation has practically all been appropriated, and the Government would not be justified in making further grants until possessed of more precise information as to stream flow than is now available. Several applications have already been refused for this reason. It is expected, however, that the results of the stream measurements now being made will show the practicability of so controlling stream flow as to permit of considerable further development within a short time. I desired to make that point before proceeding, because it shows we have reached our limit of development in the use of water.

TIMBER SURVEYS.

The next division I was going to take up in connection with the work was the matter of timber surveys. I was speaking of it in regard to the forest reserves, but it is a separate question, and I should like to speak of it particularly. The surveys are of different characters. Timber surveys have been made on the Turtle Mountain, Moose Mountain and Riding Mountain reserves, by the strip method and reconnaissance surveys have been made on the Pines reserves, Beaver Hills reserve, Spruce Woods reserve, Lake Manitoba West reserve, the Crow's Nest district, Waterton lakes and Cypress Hills reserve. The strip survey, which is an elaborate and rather expensive system of survey, was used until last year. It consists in running out half mile strips with the compass from surveyed trails, counting the trees, ascertaining their size and species and noting the topography. The reconnaissance survey covers the reserve in a general way from the trails, down to quarter-sections, and provides for giving the results more in the mass, but such a survey is sufficient to give the information required with a fair degree of accuracy and to plot the different stands of timber. Of the ten million acres in forest reserves and parks, about one million and a quarter have been surveyed, and the following stand of timber is arrived at definitely from the surveys and by estimate for the other reserves.

TIMBER ESTIMATES.

As has been previously stated, the department is making a forest survey of the reserves which should give a close estimate of the timber thereon. Such estimate

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has been made for the Riding Mountain, Turtle Mountain, Moose Mountain and the Pines reserves, and for these the following figures are close to the actual quantities. For all other reserves the estimates are only tentative:—

MANITOBA RESERVES.

	Saw Timber.	Fuel Wood.
	Bd. ft.	Cords.
Duck Mountain.....	300,000,000	3,000,000
Riding Mountain.....	250,000,000	2,500,000
Porcupine No. 1.....	50,000,000	750,000
Turtle Mountain.....	1,333,000	135,000
Spruce Woods.....	1,000,000	30,000
Lake Manitoba West.....	600,000	40,000
Total	602,933,000	6,250,000

SASKATCHEWAN RESERVES.

	Saw Timber.	Fuel Wood.
	Bd. ft.	Cords.
Porcupine No. 2.....	50,000,000	500,000
Moose Mountain.....	5,000,000	130,000
The Pines.....	.....	50,000
Beaver Hills.....	.....	10,000
Total	55,000,000	690,000

ALBERTA RESERVES.

	Saw Timber.	Fuel Wood.
	Bd. ft.	Cords.
Eastern Slope.....	3,000,000,000	50,000,000
Rocky Mountain Park.....	300,000,000	3,000,000
Jasper Park.....	100,000,000	1,000,000
Cypress Hills.....	2,000,000	100,000
Cooking Lake.....	.....	100,000
Kootenay Lakes.....	.....	10,000
Elk Island Lake.....	.....	10,000
Total	3,402,000,000	54,220,000

BRITISH COLUMBIA RESERVES.

	Saw Timber.	Fuel Wood.
	Bd. ft.	Cords.
Railway Belt and Yoho Park.....	600,000,000	6,000,000

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SUMMARY.

	Saw Timber.	Fuel Wood.
	Bd. ft.	Cords.
Manitoba Reserves	602,933,000	6,250,000
Saskatchewan Reserves	55,000,000	690,000
Alberta Reserves	3,402,000,000	54,220,000
British Columbia Reserves	600,000,000	6,000,000
Total	4,659,933,000	67,160,000

ESTIMATE OF ANNUAL OUTPUT.

The following table showing the quantities and kinds of timber taken from the reserves is also tentative as it is only an estimate. Heretofore, the quantities of timber cut on permits granted for the reserves have not been kept separate in the records from those granted for timber on other Dominion lands. It is the intention that in future, forest reserve matters shall be kept by themselves so that accurate data in regard to them can be obtained. The receipts, however, as stated in the table, may be considered as correct. The figures may seem small considering the quantities of timber removed; but it should be borne in mind that every homesteader is entitled to one free permit.

TIMBER CUT DURING YEAR ENDING MARCH 31, 1908.

District.	Lumber.	Logs.	Cord-wood.	Fence Posts.	Fence Rails.	Poles.	Receipts.
	Ft. B.M.	Lin. ft.	Cords.	No.	No.	No.	\$ cts.
Manitoba Reserves....	3,789,180	17,134	3,647	31,100	22,650	8,250	7,044 41
Saskatchewan Reserves ..	343,435	464,110	9,029	117,140	106,510	102,414	535 35
Alberta Reserves.....	1,400	332,612	1,280	52,080	247,155	48,265	56 75
British Columbia Reserves	8,338,000	.....	2,500	.....	.....	.....	4,794 00
Eastern Slope, as far north as Brazeau River.....	31,651,610	.....	56,037	336,860	1,336,700	.....	19,325 00
Total.....	44,123,625	813,856	72,493	537,180	1,713,015	158,929	31,755 51

Throwing these different kinds of material into saw timber and cordwood, we have saw timber about 45,751,325 board feet; cordwood, 105,943 cords. Dividing these quantities into the quantities estimated as standing on the reserves, and we perceive that the saw timber should last for six hundred and thirty-four years, practically forever, providing that the rate of consumption remains the same, and that no timber be destroyed by fires or other causes. To be sure, the growth has not been taken into account but it is reasonable to suppose that fires will at least offset the growth, be we ever so vigilant.

The CHAIRMAN.—That is on all the Dominion Government reserves.

Mr. CAMPBELL.—Yes, as they are set apart now. Of course that is not absolutely accurate. We have the information in regard to some of the reserves, but in regard to others we are merely guessing.

In addition to the surveys of timber reserves, there should be exploratory surveys of lands known to be generally timbered, with the object of ascertaining:—

- (1) The stand and condition of the timber.
- (2) The tracts that are unfitted for agriculture, control watersheds, or for some other reason should be held permanently for forest purposes.

Owing to lack of funds, it has been found impossible to arrange for any systematic survey of this kind, and all that it has been possible to arrange for is the protection of the outlying districts by a fire patrol, and such information as can be gathered from the reports of the rangers.

Timber surveys of the forest reserves and of the eastern slope of the Rocky Mountains should be carried through without delay. The exploration of the timber in the northern districts, should be made before railway construction, and the advance of settlement, so that the lands that are not suitable for agriculture could be determined and dealt with differently from agricultural lands. Timber on agricultural lands should be disposed of and cleared off first. Non-agricultural lands should be administered so as to be protected and kept permanently in forest, and should be used in such a way as to promote the renewal of the forest.

In regard to the forest lands in general, which are under Dominion control, I think the first step would be to have an exploratory survey, somewhat similar to the survey made by Ontario in 1889. They explored some 60,000,000 acres, and the cost was about \$10,000. Such a survey in our northern district would give us some idea of the conditions as to forest, and lands; and after we had the forest areas pretty well determined, and found out how much of the lands were not suitable for agricultural purposes, and what should be kept in forest, we could then proceed and make a more careful survey of the forest reserves, and determine the proper method of handling them.

RATES OF TREE GROWTH.

Our survey of the forest reserves included the measurement of some of the trees, to find out what the rate of growth was. We have not been able in all cases to obtain an absolute figure, but we have had sufficient, in the case of a number of species, to be able to tell with a fair degree of accuracy, what the rates of growth are, and I can give the Committee the figures for several species here. We had examinations made of some places in the Crow's Nest Pass. The following is a table of the rates of growth of the trees:—

Crow's Nest Pass.	Age 10 in. in Diameter.	Annual Diameter Growth Inches.	Annual Height Growth Feet.	Height at 10 inch Diameter.
Engelmann's Spruce.....	75	$\frac{1}{7}$	1	75
Douglas Fir.....	90	$\frac{1}{9}$	.....	.....
Lodgepole Pine.....	65	$\frac{1}{8}$	1	71
RIDING MOUNTAIN.				
Poplar.....	70 (6 in.)	$\frac{1}{7}$	$\frac{6}{7}$	56.5
" (Best rotation)	40	$\frac{1}{7}$	.....	46.5
White Spruce	75	$\frac{1}{7}$	$\frac{6}{7}$	56
Jack Pine.....	60	$\frac{1}{6}$	.....	.....
Black Spruce.....	170	$\frac{1}{7}$	$\frac{1}{3}$	53
Tamarack (Upland).....	150	$\frac{1}{5}$	$\frac{1}{2}$	65
" (Muskeg).....	170	$\frac{1}{7}$	$\frac{1}{3}$	53
Paper Birch.....	75	$\frac{1}{7}$	$\frac{6}{7}$	56.5

By the Chairman:

Q. These observations were taken in the forest were they not?—A. Yes.

Q. Were the forests more or less thick?—A. Yes.

Q. That would be no indication as to how fast these trees would grow where they had more room?—A. It would not be a sure indication, but these are average conditions of forests as we have them at the present time. They are normal conditions as we know them.

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By Hon. Mr. Fisher:

Q. These trees were not crowded enough to be dwarfed or hurt in their growth?—A. They must have been crowded in their early days when they would make a height growth, but not a fast diameter growth. Later, the trees would be thinned out, and they would make a better diameter growth. It would be a great advantage if, where a forest was started, we could thin out the trees. We would have very much better results. Of course, they could do that in European forests. The difficulty about doing it in Canada is to find a market for the material you might take out. In Germany and other countries, they find a market for all the material that is thinned out, and so they can do it profitably. If we undertook it at the present time, it would be simply an addition to the cost. The return from it would be so small it would not be a sufficient advantage.

By Mr. Beland:

Q. That table states that the black spruce takes 170 years to reach a ten-inch diameter. Does it ever reach that diameter?—A. No, it does not really. I just estimated that roughly. We have no measurements beyond eight inches. The black spruce mostly grows in the muskeg. This table gives the average of all the trees we have taken in the forests as they stand under ordinary conditions. Under specially good conditions that rate of growth might be increased, but for normal conditions I do not know that it would be. The rotation in Europe is generally from 60 to 80 years for spruce or pine, and I do not think that we are likely to do very much better than that here in Canada. Of course, trees under special conditions may grow faster, but I think the normal rate will be found to be very close to what is stated in this table, when we come to have accurate results of a large number of observations.

TIMBER SALES.

The next division that I made of the subject was in regard to timber sales. Before there was a Forestry Branch in connection with the Ontario department of course, the timber was being dealt with and disposed of under license; and the disposal of timber under license is still continued in the same way on lands outside of the reserve. Special regulations have been arranged for the reserves.

Timber outside of the forest reserves is disposed of under authority of regulations established under the Dominion Lands Act. They provide for:—

1. Granting of yearly permits without competition to settlers. Dues for timber cut are paid, except by homesteaders, and in a few other cases.
2. Granting of yearly permits to owners of small or portable saw-mills for not more than one mile square, at a fee of \$1 and payment of dues.
3. Sales by public competition under license also subject to ground rent and royalty dues.

The provision for permits for small mills was established in 1906, and was intended to furnish a supply of timber quickly and cheaply to new communities. Sales are allowed to be made only direct to settlers, and the product is not to be turned into general trade.

The regulations for the sale of timber by public competition as re-established on December 19, 1907, provided for:—

1. Sale by public auction.
2. Cruising and survey of the timber before it is put up for sale.
3. The fixing of an upset price.

No sales have been made under the regulations as amended in this respect.

The form of timber license provides that the licensee:—

- (1) Shall not cut trees less than ten inches in diameter at the stump.
- (2) Shall leave seed trees as directed by the forest officers.
- (3) Shall dispose of debris as instructed.

These provisions all have an important bearing on the reproduction of the forest, and the first is fairly well observed. In some cases, however, such as in mountainous tracts and districts, subject to high winds, it is not a satisfactory method, as the thinning of the forests means that what is left will be blown down. Clean cutting, leaving only clumps of seed trees, would be the best method in such cases. To supervise such work properly would require a larger and better trained staff than the department now has.

I would like to show the Committee a photograph in that connection, to show that the method we have adopted in preserving the forest may really only result in destroying more trees; that is, that it would be really better to cut off altogether the timber that is left after cutting down to the ten-inch diameter.

By the Chairman:

Q. Why?—A. Most of it will blow down.
Q. Some of it looks dead now?—A. Yes.

By Hon. Mr. Fisher:

Q. Does the exposure kill it?—A. Yes, that does it, too. The bark sometimes gets scalded with the sun. Fungi or insects may follow and spoil the timber. So that there are conditions under which a diameter limit is not at all satisfactory, and we would have to take a different method of providing for the natural reproduction of the forest.

By the Chairman:

Q. Would you say that would apply in the ordinary case to a spruce bush? My observation in regard to the spruce bush is that the merchantable timber comes in clumps. You may go miles without seeing a tree worth cutting, all being less than ten inches thick; then you will come to a heavy clump of trees, ten and twelve inches in diameter and sometimes two feet. There would be timber then for a half or a quarter of a mile, and then you would go another mile and meet another clump. Is that the result of your observations?—A. It does not occur that way. It occurs both ways. There are clumps of trees where the diameters would be all pretty well beyond that at which we allow cutting; but there will be scattered trees that are smaller, and in most cases it would be better to take those out while we are at it, rather than leave them.

Q. The few trees that are in that clump are liable to be damaged?—A. The spruce is a shallow-rooted tree, and if exposed to the wind will probably go over. They tried selection cutting in the States. Austin Carley, of the Berlin Mills Co., experimented. That company was the first which employed a trained forester in the handling of their pulp wood forests. The first thing he did was to start in and cut, leaving a selection of seed trees, but the next bad storm brought them all down, and he had to revise his methods. So that it means a study of the conditions in order to get the right method.

By Mr. Béland:

Q. What is the accountable cause for the dying of trees after the 10-inch trees have been removed, in your opinion?—A. Well, it would be a little difficult to say just what it is.

Q. The wind?—A. It may be the wind and sun getting in and drying out the soil. I think it is probably from that cause.

Q. Too much sun?—A. I think that would be the reason of it.

The disposal of debris is necessary in order, (1) to prevent fires; (2) to make the growth of the seedling trees easier. The simplest method of disposal is by burning, but it is not considered advisable at the present stage to make a general regulation to that effect on account of (1) the danger of the fires spreading; (2) the possible destructive effect on young trees that have started.

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Some experiments have been made in the United States in regard to the disposal of debris by burning, and they found it could be done for about 25 cents a thousand in pine forests in Minnesota. That is a reasonable figure, and if we could get rid of the debris, all the small branches and so on for that price, it would certainly be a good thing to do so, so far as that part is concerned, but there is the question in regard to the young trees that may be coming on in the ground. We have to watch that. In the burning we may destroy all the young forest which is coming up, and so far as we are concerned, we have not been able to do any experimental work of that kind yet. We have just made a very slight beginning, so that we cannot speak very confidently as to just what can be done.

By the Chairman:

Q. What are the lumbermen required to do now under the regulations that you have?—A. The regulation requires them to clear up the debris, but the trouble is, we have not been able to enforce the regulation. The regulation exists at the present time.

By Hon. Mr. Fisher:

Q. You do not indicate how you are to do it?

By the Chairman:

Q. You do not feel like enforcing it before you have some information?—A. We should find out how the work should be done, and we could go to the lumbermen and say: 'Here we have experimented and ascertained that it can be done in this way.' We could go to them with something clear, definite and distinct. There have been attempts at burning. I know that along the line of the Canadian Northern in Saskatchewan, Shaw Bros. burned some of the debris in the spring time, before the snow was all off.

By Hon. Mr. Fisher:

Q. Do they burn the debris without drying it?—A. They could at that time. There is a good deal of resin in the debris and it would burn.

Lumbering methods should be improved by a careful and thorough use of the timber.

(1) Stumps should be cut lower. 12 to 18 inches is high enough while they are now cut 18 to 36 inches.

(2) Long tops and old skidways are left. This will equal 20 twelve foot logs, 8 inches or more at the top, on every acre.

Lumbering operations in the Crow's Nest valley leave in the woods, skidways, high stumps and long tops, the following per acre:—

30 mining props	8 ft. x 6 in.
15 logs	12 ft. x 8 in.
150 feet, board measure, in high stumps.	

Per square mile there is:—

161,600 lineal feet mining props.

288,000 feet, B.M. lumber.

In addition there are left in trees under 10 inches in diameter, trees which are unlikely to stand another cutting.

Per acre:—

40 mining props	8 ft. x 6 in.
15 logs	12 ft. x 8 in.

Per mile:—

204,800 lineal feet props.

192,000 feet B.M. lumber.

The total waste per square mile is therefore:—

366,400 lineal feet mining props.

480,000 feet B.M. lumber.

The revenue to the Government from the above at current stumpage rates would be \$295.75 per square mile. The value of the wasted timber at current market prices is \$9,012 per square mile.

That is material that might just as well be taken out and used, but it is left.

By the Chairman:

Q. Where did you make the calculations? At the Crow's Nest Pass?—A. Yes.

Q. On Dominion lands?—A. Yes, under license.

Q. Is that waste going on, on Dominion lands?—A. I think it is generally. That is probably a typical case.

By Hon. Mr. Fisher:

Q. Do you mean to say the lumbermen, on an average, leave \$9,000 worth of timber per square mile on their limits?—A. That is what we worked out there. I do not know that they are all as bad as that.

By the Chairman:

Q. Do the regulations deal with it?—A. Yes, we could deal with it. We could require them to take that out.

Q. Why don't you do it?—A. The trouble is we could tell them to take it out, but we have not enough supervision to go there and see that it is done.

By Mr. McLean (Sunbury):

Q. We, in the east, insist that they shall take out the top, and we charge them stumpage, and when they pay stumpage on the top they generally take them out?—A. The difficulty is to follow it up, and with our present organization I do not see how we can do it very closely. We will call their attention to it.

Q. You have no system of inspection of the land?—A. We have a system of inspection, but when a forest ranger has a field running from the International boundary away up north to Edmonton, he cannot watch it very closely.

By the Chairman:

Q. You cannot make a minute examination of it all?—A. No.

The Dominion Government follows an economical method of administration. We take the mill cut, and collect on whatever the return shows has been cut. That is very much easier than going back in the bush and keeping check on what is done there, and it is a great deal cheaper.

By Hon. Mr. Fisher:

Q. On one side of the ledger, but perhaps not on the other.

By the Chairman:

Q. As far as taking up the amount of lumber they cut is concerned, that is a sure way, but it does not give any indication of what is going on in the woods?—A. In the present condition of the administration we cannot follow what goes on in the wood. A ranger goes out occasionally, but he cannot cover the ground.

By Mr. White:

Q. What length would the tops that are left average?—A. I do not know just exactly what the length of them would be. The calculation that was made was that they would equal twenty 12 foot logs eight inches or more at the top, on every acre.

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Q. Do you not think that might be one reason why the lumbermen do not take them out, because most of the lumbermen cut their logs to a certain length, 12, 16 and 18?—A. That might be one reason why they would be left there—because they could not be profitably disposed of. Of course the question of profit comes in all the time, in deciding as to whether a lumbering operation can be done thoroughly or not, but still we ought to clear up the ground thoroughly and take anything of value off it, so far as we can. At the present stage of development in Canada, I think we could easily find a market for all that material if they would only take the trouble to get it out, especially in the Crow's Nest valley, where there is so much timber required for mines.

By Mr. McLean:

Q. The great trouble with the top is the danger of fire?—A. Yes, that is one of the greatest dangers.

By an Hon. Member:

Q. In clearing up this debris, would it be better to have a fire, irrespective of the injury which might result to the young trees? My experience in the lumbering country north, is that reforesting proceeds much faster after a fire has gone over it?—A. That is quite true. The seed will germinate only when it reaches the mineral soil, and if a fire runs over the ground, it just prepares the bed for the seed properly, and if you have the seed supply, you will have a better reproduction after the fire than if the fire had not gone over it. But the question is as to the damage that may be done by the fire going over it.

By Mr. Fowke:

Q. As to the damage by insects, has a study been made as to how serious that is?—A. We have not been able to make any very close study of it. On the Riding Mountain reserve we did study it to a little extent, because the spruce was being attacked by the insects, and about the only remedial measure we could take there would be to get the timber that was attacked out, that was all we could do. We made the closest survey on the Riding mountain, and it was in the process of that timber survey that we ascertained that the spruce was being attacked by these insects, and the only way we could see of handling it at the moment was to get the timber out. The trouble in disposing of it, is that when it is damaged it is not as valuable as if it were sound.

Q. Did the United States government not declare that the only way of correcting it was to destroy the timber?—A. That is generally the only way. It is a difficult matter to deal with. The insects are small and numerous, and it is very hard to destroy them, unless some parasite is introduced that will attack them. It is a difficult matter to deal with, except by taking away the timber. In the Black Hills in Dakota, they had trouble with insects on one of the government reserves, and the only remedy they discovered was to take the timber out as quickly as possible, and burn up any place where the insects might harbour—destroy their homes.

Q. Would your fire rangers be competent to detect anything of that sort in a particular district?—A. Our rangers might notice that trees were being injured, but they are not trained men in anything of that kind. I think that in time we may get them trained to observe matters of that kind, and perhaps be able to tell us fairly well when such injury occurs, because with the technical men on our staff now, we intend to have such things discussed. The inspector of Forest Reserves is meeting with the rangers for the Manitoba Forest Reserves at Neepawa within a few days of the present time, and he is going to discuss the whole matter of the reserve management with them, point out things of that kind, and talk matters over—a sort of school for forest rangers. and I think in that way we will gradually get them to see things, and when we find any difficulty of that kind, one of our experts will go in and make a special examination of it.

STATISTICS.

The only statistical statements prepared by the Forestry Branch until last year were in regard to forests under Dominion administration, though statistics in regard to all parts of Canada appeared in the reports of the Forestry Association.

Mr. Stewart, then Superintendent of Forestry, in 1903, made the following estimate in regard to Dominion lands:—

'It will be seen from the census of 1891 that an estimate is made of the area of forests and woodlands for each of the provinces and also for the territories. That of Manitoba and the Territories is placed at 722,578 square miles. Add to this 20,000 square miles of Dominion territory in the railway belt in British Columbia, and we have 742,578 square miles as the total on Dominion lands. Probably about one-fifth of this contains merchantable timber, or say 150,000 square miles, or 96,000,000 acres. After thus reducing the area and remembering that in addition to the timber suitable for lumber, a large part of it is covered with spruce, valuable for pulpwood, it can scarcely be considered an extravagant estimate to place the merchantable timber, including pulpwood, at 2,000 feet board measure per acre, or in all, 192,000,000,000 feet. We have thus arrived at a very rough approximation of the quantity of timber now fit for use on the lands owned and controlled by the Dominion.'

That was Mr. Stewart's statement. This was merely an estimate and it remains to be seen whether it will prove true, but it was conceived on a reasonable basis. I would like to call attention to what Mr. Stewart says in regard to the timber after he took his trip down the Mackenzie. I think perhaps, I might read this part of it to the committee, and they will understand what Mr. Stewart's idea was as to the stand of timber in that country:—

'It would undoubtedly be misleading, with our limited knowledge of the greater part of that country, to attempt to define the areas that may, with the settlement of the country, offer profitable fields to the lumbermen. It is true that there has been for many years a good deal of travel through the country, but the routes taken are mostly confined to the great water courses. While in the country, I made diligent inquiries from those I met who are engaged by the companies, and who take the place of the old 'coureurs des bois' of the early days in 'tripping' in winter, visiting the hunting lodges of the Indians to get furs. Occasionally, some of the information obtained seemed valuable, but even these routes or dog trails are always chosen where there is the least timber to obstruct the course, generally along the lakes and rivers or through level and sparsely timbered muskegs. The Indians, being interested in the fish and game of the country, can give reliable information concerning them, but it would be unwise to make any calculations from what information can be gained from them regarding either the quantity or quality of the timber in the country.'

'I am more than ever impressed with the view that I have long held, that no more judicious expenditure of public funds can be made than what would be involved in a regular system of the exploration of our unoccupied lands.'

'So far as our present knowledge affords us a means of judging, the whole of the Arctic basin, except the barren lands of the far north and certain limited areas in the watersheds of the Athabasca and Peace rivers, which latter are prairie, may be correctly described as forest lands.'

'It must not be inferred that the whole of this vast area is timbered in the same sense that Ontario and Quebec were in the primeval state. The timber is not as large, and by no means as evenly distributed. Very frequently after proceeding a mile or less from one of the large rivers, we will enter a muskeg with only a few small scattered spruce and tamarack here and there dotting the landscape. This will probably continue until we approach a small stream draining the muskeg. As we pass down such a stream, we will frequently find very good spruce, poplar and birch along the banks, and extending for varying distances to the right and left.'

'From the information at hand, I think it quite safe to assert that the largest extent of timber in the Mackenzie basin, as well as the largest in size, is to be found

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along the tributaries of the Mackenzie which flow from the west, such as the Athabasca, the Peace, the Liard, the Nahanni and others. It must be remembered that these are themselves great rivers with many tributary streams, and the aggregate quantity of spruce, which is the principal timber tree in that region, must be very large; while trees of the same variety, large enough for pulpwood, are found in great quantities throughout the whole of the Mackenzie waters and extending all the way down to the delta of that river.'

As inquiries were constantly being made for forest and timber statistics, Mr. A. H. D. Ross, lecturer in the Forest School of the University of Toronto, was appointed last summer to gather all available statistics in regard to the forest area and forest products. Unfortunately, it was found that they were very meagre; but they have been compiled and show the state of our present knowledge.

The inquiry, however, brought out some points clearly:

(1) That no systematic or sustained effort had been made by either the Dominion or provincial governments to survey or determine their forest areas or resources. The government of the province of Ontario in 1899 made a special exploration of its northern districts. The Dominion government has been conducting, in a small way, surveys on its forest reserves.

(2) The data in regard to forest products were obtainable only for the census years, and the form in which they were published did not give sufficiently detailed or classified information.

To remedy the first difficulty, the Dominion and provincial governments will require to make systematic forest surveys, which will show the stand and condition of the timber. The province of Quebec offered, with federal assistance, to collate what material is at present available, and the province of Nova Scotia asked for the assistance of the Dominion government in making a forest survey of the province. Owing to a lack of men and money, it was impossible to consider these requests.

It may be pointed out, however, that the Federal government of the United States has assisted the states in making such surveys, particularly by giving the services of its forest officers, and there seems to be no valid reason why the Dominion government should not pursue a similar policy.

To meet the second point, arrangements are being made by the Forestry Branch to gather directly the statistics of forest products of Canada so that they may be available each year. The lumber and other associations interested in wood products, and all the trade papers have been communicated with to get their interest and support. Circulars have been prepared to be sent to lumber, pulp and paper mills, steam and electric railway companies, telegraph and telephone companies, and all companies and firms using wood products in any form. Lists of these companies and firms are being compiled, and a first effort to gather the information required will be carried out this year. It will take at least three or four years to complete the system and get results that will be full and reliable. It is proposed to publish each year reports of the results.

I may say that in this respect, we are following the lead of the United States service. They have for three or four years been gathering information and statistics of this kind, and last year they obtained statistics which could be considered almost complete and thoroughly reliable; but it took them three or four years to reach that point. In the first place it took them some time to gain the confidence of the lumbermen and the users of wood products; and in the next place it took them some time to become acquainted with the location of the mills and manufacturers, so that they could obtain full information.

FOREST AREAS.

I have made a comparison of our estimates with those of the United States. In British Columbia, the forest and woodland area has been estimated by the provincial authorities at 182,000,000 acres, but they make no attempt to estimate the quantity of timber thereon. The only attempt at an estimate made recently is by Dr. Judson F.

Clark. He estimated the forested area at 26,720,000 acres, and the stand at 320,000,000,000 board measure, or a stand of nearly 12,000 feet per acre. There is a wide margin between the area estimated by Dr. Clark and the estimate of the provincial authorities, and it leaves the possibility of a large addition to Dr. Clark's figures of timber stand. I know that outside the area that Dr. Clark has covered, there are occasional stands of timber that run pretty high. Up in the northern and central part, I know stands that I have information of that run 40,000 to the acre, and other stands that run over 16,000 to the acre, and I think probably when we come to know what there is, we will be able to enlarge somewhat on Dr. Clark's figures. If there is not mature timber, there is wood that would be suitable for pulp, and if the forest area of the province, outside to the timber area of 27 million acres computed by Dr. Clark, is covered with pulpwood at an average of four cords to the acre, there will be 500 million cords of pulpwood.

Compared with the Pacific coast forest of the United States, as estimated by the Forest Service, which gives a forest area of 80 million acres, a stand of 1,100 billion feet, board measure, or an average of 13,750 feet per acre. This would indicate that Canada had not as large a stock as the United States. It may be pointed out, however, that before 1900 an estimate of the stand of timber on the Pacific coast of the United States was made at 1,000 billion feet, in 1900 it was reduced to 600 billion, and in 1902 to 525 billion, and it has not been restored to a little larger than the first figure. The result will probably be the same in Canada, and final inspection will place us in a better light than the present estimate shows; but it is unlikely that the quantity on the Pacific coast of the United States can be equalled.

There are two factors in favour of the Pacific states:—

1. The forests consist of Douglas fir, cedar, sugar pine, redwood and such trees, yielding large quantities per acre; while in the northern and central parts of British Columbia, the yield must generally be smaller.
2. The forests of the trees named are less easily damaged by fire than those of the smaller and thinner barked trees of northern British Columbia, which, have therefore probably been destroyed to a greater extent.

In those forests of Douglas fir, an ordinary forest fire does not do very much harm. It cannot get through the thick bark.

By the Chairman:

Q. On the Pacific side of the slope?—A. Yes.

Q. There is a wet undergrowth, too?—A. Yes, but the trees are large and are protected by the heavy bark. The only danger in a country like that is after lumbering operations, since the debris is left, the fire becomes fierce and hot. I might say, while we are talking about fires, we are inclined always to speak about fires in connection with the destruction of the mature tree, but when matured trees are destroyed, you can generally take out a very large proportion of what is damaged, unless it is a severe fire. If it is taken out within the year, it can be used to a considerable extent; but when the young trees are burned, they are absolutely gone; we can make no use of them whatever, and we have to start the process all over again from the beginning.

In regard to Dominion territory, Rocky mountain and northern territories, the estimate made by Mr. Stewart for this territory is 96 million acres, with a stand of 192 billion feet or two thousand feet per acre. In the absence of any other estimate, this may be accepted for the present. Compared with the Rocky mountain forest of the United States which is computed at 100 million acres with a stand of 300 billion feet, the United States in this region, have a larger area and a much better stand. It may be pointed out that the estimate of the stand for the Rocky mountain district for 1900 was 100 billion feet. It was reduced to 30 billion in 1900, and it is now 300 billion.

I desire to point out that until we are able to estimate closely, and know absolutely what we have, we are bound to have large variations in estimates.

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By Mr. McLean:

Q. How do they make the estimates? Do they estimate all the lumber on the land, and how small do they go?—A. You mean in the United States?

Q. Yes. You say 12,000 feet per acre. Do they estimate the merchantable lumber down as low as five or six inches?—A. I think the estimates of the United States are based on merchantable timber so far as I know. I have not had an opportunity of going into it with the United States people to find out what basis they proceed on.

Q. Perhaps they go as low as five inches?—A. It may be as low as that.

In Ontario, there is no complete official estimate of the forest areas or of the stand of timber. The estimate runs variously. I think about 80 or 90 billions is Ontario's forest, but the pulpwood was estimated by the expedition sent out to the north country at 300 million cords, and an estimate of the pine is made at 20 billion feet. I think that is about right because it was made carefully.

By the Chairman:

Q. Twenty billion feet in the province of Ontario?—A. Yes, it is not a very large quantity to have to draw upon.

Q. It is getting pretty small?—A. That is the estimate given by the Deputy Minister of Lands and Forests of Ontario.

Q. I thought it was 35?—A. Twenty was his last estimate. There have been several estimates given varying between twenty and forty, but suppose it is forty billion feet, it is not a very large quantity when you consider the matter. The reason we begin to understand where we are at now, is the fact that the United States have begun to reach a fair idea of what they use and what there is left. The figures they have been compiling during the last three or four years in regard to the use of forest products, have taught us how much use is being made of these products, and we are beginning to see what a drain there is on the timber resources.

By the Chairman:

Q. It was stated in an address the other day, that the highest estimate of timber for the United States was 2,000 billion, and their annual consumption 100 billion. Thirty billion was allowed for growth, leaving a net consumption of 70 billion, which would be a trifle less than 30 years' supply at the highest estimate. Do you know how much the annual cut of white pine in Ontario is?—A. I have not pine separately. There are 936 million feet according to the provincial returns. Of course there may be some on private lands.

Q. About a billion?—A. About a billion, I suppose.

By Hon. Mr. Fisher:

Q. That is all kinds?—A. Yes.

By the Chairman:

Q. But nine-tenths of it would be pine?—A. Yes. There is no estimate made by the Ontario provincial authorities, but for the United States they give for the northern districts, an area of 90 million acres, and a stand of 300 billion feet, and I think probably Ontario might off-set that northern district fairly well. I think probably when you come to take in everything, Ontario might run 300 billion feet. That is including pulp wood and everything.

QUEBEC.

For Quebec, the only general estimate that has been made is that of Mr. J. C. Langelier, and it was published by the provincial authorities in the absence of exact information. It shows a forest area of 130 million acres, and a stand of 479 billion feet, board measure, or an average of 3,500 feet per acre. The stand is estimated to be

made up as follows: Pine, 40 billion feet, board measure; spruce, hemlock, &c, 118 billion feet; hardwoods, 21 billion feet; pulpwood, 600 million cords or 300 billion feet.

This might be set off against the southern forest of the United States, which is given as containing 150 million acres with a stand of 550 billion feet, board measure, but would leave Canada somewhat behind.

When we compare the estimate of 40 billion feet of pine with Ontario, I think it will be found a little large, because Ontario probably has as much pine as Quebec. Either Quebec's estimate is a little large, or Ontario's estimate is too small. I think Ontario's estimate has been made a little more carefully.

By the Chairman:

Q. The estimates from Quebec show great discrepancies?—A. Yes.

Q. I examined several estimates, and I found the official report giving 150 billion feet of white pine, and the Chief Forester's report, six months afterwards, said only 75 billion?—A. That goes to show that we know practically nothing about it. Every man has a guess coming to him. I do not think our stand is anything like as good as in the southern states from what I can learn about it. They have a good continuous stand of pine there that is better than anything we have left here.

Recently, an inquiry was made by the Admiralty as to the reason why the quality of the timber, that they were getting from Canada for Admiralty purposes, was deteriorating and the quantity offered growing less, while the prices seemed to be increasing. I made inquiries of the provinces of New Brunswick, Quebec and Ontario before preparing a reply. Quebec said they had made no inquiry into the matter; New Brunswick did not have anything much more to say, and Ontario did not give any answer at all; so I prepared a reply stating, that the reason, so far as I could judge, was the fact that the timber was getting scarcer and more difficult to reach, and that we did not have the quantity and quality we once had. They asked also, if there was any new field likely to be opened up. I replied that we knew pretty well where the forest areas of Canada were, and I did not see much probability of any new area being opened up. The only new places in Canada where they might get it, where they had not been getting it before, was the province of British Columbia.

Q. Do you remember what class of timber they were getting?—A. Pine.

The forest area of New Brunswick is officially stated at 7,250,000 acres.

By Mr. McLean:

Q. It is estimated that New Brunswick owns about 8,000,000 acres of forest lands. That does not take into consideration land owned by private parties. The New Brunswick railway had a land grant of 1,700,000 acres, and that added to large blocks owned by private parties would represent an area altogether of about 2,000,000 acres. The estimated cut for this year is 120,000,000 feet of spruce?—A. I am taking the figures furnished to me by the officials.

Q. Do you not think that the figures are only for the areas owned by the province itself?—A. They are given as figures covering the forest lands generally. The figures are furnished by an official of the government.

Q. Probably you have written to an official who replied that the province owned that much. The area is estimated roundly at 8,000,000 acres?—A. I shall be very glad to see the area increased, but that is what was given in papers read at the meeting of the Forestry Association.

Q. Gibson & Co. owned 300,000 odd acres in freehold?—A. If we can increase the area and the quantity, it would be a good thing. I am taking the figures as they were furnished. We do not know anything directly of New Brunswick, and we have to take the figures sent us. The stand of timber in New Brunswick is estimated at 22 billion feet, board measure, or 3,200 feet per acre. The stand of spruce is put at 13 billion feet; of pine at $2\frac{1}{2}$ billion, and of hardwood at $4\frac{1}{2}$ billion.

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The forest area of Nova Scotia is put at 5,000,000 acres, and the stand of timber at 12 billion feet, or 2,400 feet per acre. Spruce is estimated at $5\frac{1}{2}$ billion feet, hemlock at 4 billion, and hardwood at $1\frac{1}{2}$ billion.

The forest area of Prince Edward Island is estimated at 480,000 acres and the stand at 600 million feet, or an average of about a thousand feet to the acre. Totaling the maritime provinces, there is an area of 12,730,000 acres with a stand of 34,600,000,000 feet, board measure. Off-setting this against the estimate of the United States for the central district, it will be found to make no comparison whatever. The central district of the United States is estimated to comprise an area of 130 million acres with a stand of 252 billion feet, an average stand per acre of about 2,000 feet, board measure.

In summing up, it can only be said that there is not the information available at present for a reliable estimate, either of the forest area or of the stand of timber. The forest area may be placed at 500 million acres, of which half may be covered with timber suitable for sawing into lumber, while there are in addition large quantities of pulpwood. With the present production and export, the supply may last indefinitely, but with the steady increase of population and domestic demand, the import required by Europe which is a net amount of at least $2\frac{1}{2}$ billion feet, and the demand that will soon come from the United States, which is exemplified in the rapidly increasing pulpwood export, the outlook for the future is not encouraging.

In comparing the records of the United States with those for Canada, it will be seen that the total area for the former is given as 550 million acres, 200 million acres of which are mature timber; so that as far as forest area is concerned, the two countries are nearly equal. The division in regard to the title to the forest lands, in the United States is as follows:—

Farmers' woodlots	200 million acres, 300 billion ft.
Large private holdings	235 " " 1,700 "
Public forests	115 " " 484 "

From the fact that the farmers' woodlots show such a large area and stand, it will be seen that the gathering of information has been done on a thorough basis. From present information, it would look as if on the best expectations, the forest resources of the Dominion will not be found, even on a thorough survey such as has been made in the United States, and the inclusion of all possible stands of timber, to have a forest resource nearly equal in quantity and quality to that standing in the United States. I understand that the United States are not satisfied even with the information they have, but are proposing in connection with the next decennial census to have a thorough timber census of the whole country, and they hope to get complete figures. I may say, too, that while our knowledge is not very definite here, it cannot be otherwise for some time to come, until we have covered all the timber areas fairly well. The only possible way to get that information is to go on and make surveys such as I have indicated.

TREE PLANTING ON THE PRAIRIES.

Now, one other matter that comes under the Forestry branch is the tree planting on the prairies. There are a few figures here which will show in a general way what has been done. In 1901, the department arranged a system of furnishing trees free to farmers on the prairies for planting as wood lots and shelter belts. It is considered that this action is justified from the general benefits derived from the planting of trees, and that the work should be done by the Dominion government as it controls the lands in the provinces. The establishment of windbreaks and plantations makes it possible to raise a great diversity of crops with increased yields. They will eventually supply fuel and fencing material, where at present such cannot be obtained, except at great expense or inconvenience, will change the bare and uninviting aspect of the prairie and make it attractive for settlement, will establish homes with comfortable surroundings, and generally tend to the happiness and welfare of the whole community.

In planting trees on the prairies the great secret of success is careful cultivation. Every applicant for trees is therefore required to have his land carefully cultivated before trees are sent to him, and must undertake to continue cultivation for at least two years after the trees are sent out. To ensure that these conditions are observed, an inspection is made by a departmental inspector before the trees are sent out. These inspectors are trained men of some experience in the west. They see whether the land is prepared properly, advise as to the location of the woodlots or shelter belt, and the species which should be planted. After the trees are planted they are inspected for two years to see that they are properly cared for, and how they have succeeded. The percentage of success is, in general, 85 per cent.

The following table, showing the number of trees distributed, the number of applicants supplied, and the number visited each season, readily shows how quick the western settlers have been to take advantage of government assistance in tree planting as soon as it was demonstrated that such work would not mean simply a waste of labour:—

	No. of applicants on inspectors' list visited during previous summer.	No. of settlers supplied with trees.	No. of trees distributed.
1901.....	54	47	58,800
1902.....	550	421	468,800
1903.....	1,070	616	920,000
1904.....	1,649	1,020	1,800,000
1905.....	2,218	1,122	2,000,000
1906.....	2,900	1,127	2,034,125
1907.....	3,750	1,371	2,000,000
1908.....	3,206	1,424	1,900,000
Totals.....	15,333	7,148	11,181,825

The number of trees now distributed, planted according to the regulations of the Forestry Branch, namely, at the rate of 2,270 trees per acre, would cover an area of 4,925 acres.

There are ready for distribution this spring.—

Manitoba maple	1,575,375
Green ash.....	734,000
Cottonwood.....	256,000
2,574,375	

Also thousands of cuttings of willow and Russian poplar.

The main objects of the present free distribution of trees by the Forestry Branch may be briefly summed up as the following:—

1. To disseminate, as widely as possible, correct information as to how to plant, and what varieties to plant to achieve success.
2. To establish absolute proof, in the shape of successful plantations, as to the practicability of tree planting.
3. To encourage thereby a more general interest throughout the prairies so that every settler will, in time, do a certain amount of planting, by the beneficial effects of which the whole country is a gainer.
4. To demonstrate to the settler the fact that he can, to a great extent, raise his own fuel and fencing material on his own farm, at a much less expense, than he is now put to purchase what he requires.

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The following are the varieties of trees sent out by the Forestry Branch with the percentage indicating in what proportions:—

	Per cent.
Manitoba maple or box elder (<i>Acer negundo</i>)	30
Native green ash (<i>Fraxinus viridis</i>)	45
Americal elm (<i>Almus Americana</i>)	9
Dakota cottonwood (<i>Populus deltoides</i>)	11
Golden and acute leaf willows	$4\frac{1}{2}$
Russian poplar	$\frac{1}{2}$

With the exception of the Dakota cottonwood, all this stock is grown on the Dominion government's nursery. The cottonwoods are imported from Dakota, where they grow naturally on the river bars. They are laid down at our nursery extremely cheap, and in good condition. This variety can only be propagated commercially from cuttings, but this method would be far more expensive than importing the seedlings. The area from which such seedlings may be collected, is somewhat limited, as stock grown in the states south of Dakota, would not be at all satisfactory for planting in the Canadian northwest. The shippers state that the natural supply of cottonwood seedlings is becoming annually less, due to the fact that the most of the large seed trees along the rivers are being rapidly cut off. If later on, it becomes impossible to obtain seedlings from Dakota, it will be necessary to undertake the propagation of this variety from cuttings on the nursery.

The golden and acute leaf willow are both extremely hardy and rapid growing sorts, most suitable for prairie planting—these are propagated only from cuttings, and until a good stock is established on the nursery from which cuttings can be obtained, the number for distribution cannot be greatly increased.

The Russian poplar is a fast growing tree, but it is not so generally suitable as the other kinds. It is found to be subject to rot and decay, when ten years of age and older, especially on the richer soils. On the whole, it cannot be considered a satisfactory tree for general distribution, and is only used when conditions seem specially suited to its growth, as for instance on poor and sandy soils and somewhat dry situations.

The Manitoba maple are sent out as one year seedlings, the ash and elm at two years old.

The seed of maple, ash and elm is collected if possible in Saskatchewan, generally along the Qu'Appelle valley in the neighbourhood of Indian Head. If, owing to any reason, there is no seed there, an effort is made to get it from Manitoba. Sometimes, owing to very unfavourable seasons, the seed crop is a total failure over the whole west. This was the case in 1906, when it became necessary to import maple seed from North Dakota.

The elm is probably the most valuable tree, and it is unfortunate that there is so much difficulty experienced in collecting seed of this variety. Seed years are irregular, and when there is a good crop of seed, the time during which it may be collected is extremely short. The seed is light; and as soon as it is ripe, very little wind is required to blow it all off the trees. For this reason, and because the seed cannot be stored for any length of time without losing its vitality, there is no certainty of raising a crop of seedlings every year; and even in the best seasons, only a limited supply of seed can be procured. That is unfortunate, because it is one of our most valuable trees. It grows fast and easily. There is not much difficulty growing it once you get it going. It has succeeded very well in all parts of the west wherever we have planted it.

The CHAIRMAN.—On Broadway, Winnipeg, as long as 27 years ago, they planted young Manitoba maples, and they grew fairly well until they got to be about ten years old, and then they began to get stunted and did not make growth. About 15 years ago they put in a lot of young elms about as large around as my finger, and at that time the maples were four or five inches thick. Now the elms are bigger than the maples, considerably larger and growing very fast.

By an hon. Member:

Q. Another thing about the elms on Broadway, they apparently all grow. They do not seem to die out. The maples die, but the elm seems to grow right along?—A. The only advantage about the maple is, it grows almost anywhere and grows very fast. It furnishes shelter very quickly on the prairie.

By the Chairman:

Q. It grows fast for a while. It seems to have two periods of growth; it grows fast for a while and then it will stand, but if it gets over that, after a period of years, it seems to take a fresh start and will then grow to be a big tree. What about the poplar? Have you planted many of the ordinary poplar?—A. No, we have not used the ordinary poplar at all. Cottonwood is the only poplar that we have used.

Q. What is your reason for not using the native poplar?—A. It can be got so easily, almost everywhere that we have not thought it necessary to undertake to supply it.

Q. For firewood and windbreak, I should think it is the best tree you could have, because it is pretty nearly a sure crop?—A. It is a sure crop.

Q. And it is splendid firewood?—A. Yes, the aspen poplar, what is called white poplar in the west, is a very good tree, it is found almost everywhere, and we did not think it necessary to undertake to supply it; moreover, it is difficult to gather the seed.

Q. Did you ever try hickory?—A. We have not tried hickory on our nursery station. They have tried it on the experimental farm; it has not been very successful there.

Q. You have not tried it out west?—A. Not at our nursery station, but they have tried it on the experimental farm at Indian Head.

Q. What success has attended the experiment?

Hon. Mr. FISHER.—I could not give you the report on it.

The CHAIRMAN.—Hickory is commercially a very valuable wood. It is disappearing, and it will always have an increased market value. It is used for special purposes, such as the manufacture of wagon and buggy spokes.

Hon. Mr. FISHER.—It is not a fast grower.

The CHAIRMAN.—I have had a rather peculiar experience myself with hickory on my own place on the St. Lawrence. When I got the place there had never been anybody on it since the flood. I found a lot of young hickory trees on it, which were mostly stunted; that is to say, a good many of them were evidently old trees, but they had not grown large. I cleaned out the place, cut all the old dead pines and underbrush, and it is absolutely astounding the way those hickory trees have grown. They simply have been growing like weeds. Some of them have grown so fast that they have split the bark; the bark was old and tough. I want to ascertain whether the department have taken any steps to experiment with hickory, because if they have not, I think they ought to do so. If they could get hickory to grow in plantations, it would be a very valuable wood.

Hon. Mr. FISHER.—I think the growth of hickory depends very much upon the soil. You sometimes come across a grove of hickory in one particular place in a district, and you will not find it anywhere else in the neighbourhood. It is not a generally dispersed tree.

The CHAIRMAN.—Where I lived when I was a child, we had a great deal of hickory. It does not grow in groups there, but you find odd trees in the woods. I am speaking of the county of Lambton. It was a hardwood forest originally, and where you find any woods, there are all kinds of hardwood trees and, among them, you find a few scattered hickory trees, but no clumps of hickories.

Hon. Mr. FISHER.—My observation in the east is that the hickory grows in clumps in certain places. That is the case all throughout eastern Ontario and Quebec.

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The CHAIRMAN.—The larger portion of the county of Lambton was originally a level swampy district.

WITNESS.—I have never seen any but the bitter hickory tree here.

Hon. Mr. FISHER.—We have the sweet variety also.

The CHAIRMAN.—Under some circumstances, it grows very fast and it is a valuable wood.

Hon. Mr. FISHER.—On the island of Montreal, and some of the volcanic slopes that rise on the plains of the St. Lawrence, there are a good many of the sweet hickory variety.

The CHAIRMAN.—A suggestion was made some years ago in the House that the department should try if hickory would not grow on the western prairies. I do not remember if it was ever tried.

WITNESS.—We can easily make the experiment.

Mr. MCLEAN.—Has any evidence been given as to the danger of fires from the railroads running through forest lands?

The CHAIRMAN.—Yes, we took that up last time and we intend to consider it further.

Mr. MCLEAN.—It is a live question with us in New Brunswick now with the National Transcontinental Railway under construction.

The CHAIRMAN.—We intend to invite some of the National Transcontinental Railway commissioners to explain to us what they are doing to prevent the spread of forest fires.

Mr. MCLEAN.—The state of Maine has had a great deal of trouble from that cause. Would it not be advisable to ask some of those who have undertaken to protect the forests of Maine to come here and give evidence?

The CHAIRMAN.—If there is an expert who can give us valuable evidence on the subject, we should like to hear him.

Mr. MCLEAN.—I have an expert in view. He is a fire commissioner in Maine, and has made a practical study of the subject.

Hon. Mr. FISHER.—One of the first things to be done in that respect is to get one of the officers of the National Transcontinental Railway Construction commission here, and he will tell us what they are doing. They have done a good deal I know.

WITNESS.—All the stock in the government nurseries, except cottonwood, is raised in the nurseries there. From 1901 to 1904 the experimental farms at Brandon and Indian Head kindly gave the use of a small portion of land. As work increased it was found necessary to enlarge the operations, and in 1904 work was commenced on 160 acres near the town of Indian Head. It is there that the present forest nursery station is established. In 1903 this quarter section was unbroken prairie, and it is somewhat slow work to get the soil under a suitable state of cultivation for nursery purposes. It is also necessary, in order to be successful in raising nursery stock, to have good shelter. This, of course, takes a few years to establish. As soon as this nursery station is used to its full capacity, it is expected to raise annually for distribution about four million seedlings and cuttings.

The following areas were occupied during the growing season of 1908 with the various classes of stock:—

Broad Leaf—

	Acres.
1 year old Manitoba maple.	19
1 year old Manitoba maple.	18
2 year-old green Ash.	11
1 year-old green Ash.	16
1 year-old American elm.	1½
Planted to willow cuttings for propagating stock.	3
Planted to Russian poplar cuttings for propagating stock.	1

Conifers—

Transplanted native tamarack..	1
Transplanted evergreen conifers.	2
Conifer seed beds.	$\frac{1}{2}$
Total under nursery crops	55

I may say that the cost of all this work for last year was about \$19,000.

By Hon. Mr. Fisher:

Q. That is just the tree distribution?—A. Yes, the nursery station, inspections, and everything in connection with it.

Q. How much have you for the Forestry Branch?—A. Altogether one hundred thousand dollars.

Q. Besides the Civil Government salaries here?—A. Yes, that is besides Civil Government salaries here.

SAMPLE PLANTATIONS.

Besides the raising of nursery stock, it is intended at this nursery station to make thorough and extensive trials of all such trees as are likely to be at all suited for prairie growth, but which are at present not sufficiently known. Small plantations situated side by side, of all hardy varieties, will be set out in a convenient place for visitors to inspect them so that they can readily compare one variety with another, and form their own opinions as to what advantages one has over the other for any particular purpose.

Last spring several small exhibition plots were set out, containing 100 trees each, set 4 by 4 feet. The plots are arranged side by side in order that one variety may be easily compared with another.

Pines—

Scotch,
Cembra,
Dwarf Mountain,
Lodgepole,
Jack.
Cedar.
White Birch.

Larch—

Tamarack,
European,
Siberian.

Spruce—

White (Nativa),
White (Dakota),
Colorado.

PERMANENT PLANTATIONS.

It is also proposed to establish permanent plantations of considerable extent. These will be made up of all the known hardy varieties which will be planted both pure and in different mixtures. Accurate notes will be kept as to any expenses in connection with these plots, such as cost of planting, cultivation, &c. Careful measurements will be made from time to time, and as soon as it is advisable to do so, cutting will be made. In this manner information can be secured as to what varieties are most profitable to raise for fuel or for fence material, &c., the cost of planting and establishing prairie plantations can be accurately arrived at, and other information of great practical benefit to every farmer living on the treeless plains. What is necessary is, to be able to say definitely, just how much it will cost him to plant, just how long it will be before he can cut his trees at a profit, and also to show him why it is better to plant this variety, and why it is to his advantage to plant and cultivate in a certain way. He then has something definite to go on. The individual farmer has neither the time nor money to experiment in this way for himself, nor has he the incentive or facilities for disseminating the results of his experience, so that others may benefit from his work. It is as clearly the duty of the government to work along these lines, as it is to experiment with agricultural crops. Such information

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can only be secured after a number of years, but it can be obtained in no other way than by establishing such plantations as those proposed on the nursery station.

Already some 40 acres have been planted. The original nursery (160 acres) has been added to by taking in an adjoining quarter-section. This is a somewhat rough piece of ground not well suited for raising nursery crops, but admirably adapted for permanent plantations. It is proposed to use the greater portion of this 160 acres for that purpose.

CONIFERS.

Up to the present but little has been done in the west in the way of extensively propagating and planting conifers. The conifers are undoubtedly the most valuable trees that can be used. The evergreens especially, are useful in the west, from the fact that they retain their leaves during the winter, form very dense and compact belts for shelter purposes, and after once becoming established, they can withstand severe droughts better than the broad leaf varieties. The native evergreen conifers are comparatively rapid growers, once they take hold; they are long lived, and the wood produced by them has a high fuel value, and in the case of the jack-pine is very useful for fence posts and railway ties.

The native larch or tamarack is a tree which gives great promise as a most valuable variety for general planting. The seedlings seem to stand transplanting exceptionally well, and after planting, the growth is sturdy and rapid. Though this variety has not been widely tested, still there is no question as to its tardiness. It is likely to prove most successful on the better soils in the districts where the annual rainfall is not too small. Roughly speaking, it should prove successful anywhere east of Moosejaw, and again in the further west along the eastern slope of the mountains as far as the line of railway running from Macleod to Edmonton. In the drier districts between Calgary and Swift Current, it is doubtful whether the larch would be useful.

The white spruce and the jack pines (*pinus murrayana* and *pinus divaricata*) can be recommended for general planting anywhere, though in handling and planting these varieties, somewhat more care and knowledge of tree culture is required than in the case of the broad leaf kinds.

The conifers will be thoroughly tested on the nursery stations, and it is hoped we may be able to work up a stock for general distribution by 1911. As compared with such varieties as maple and ash, nursery culture of conifer seedlings and transplanting are expensive. The seed has to be sown in specially prepared beds, which during the first two seasons must be shaded from direct sunlight. In two years, the little plants may attain a height of from 3 to 5 inches. In the third year the seedlings are moved from the seed beds, and transplanted into other beds where they are given more room to grow. After two or three seasons in the transplanting beds, they are usually large enough to set out in permanent plantation. The length of time they have to remain in the nursery, and the amount of hand labour necessary in their transplanting and cultivation, adds much to the cost of these coniferous plants.

By the Chairman:

Q. As a result of these operations, what is the total number of trees now growing in the Northwest?—A. We have distributed about eleven millions, and eighty-five per cent of those were reported to be all right from the inspection of our officers. We are establishing some permanent plantations on the nursery stations, and last spring we set out quite a number of acres in that way. Perhaps it would be of interest to see what percentage of success there was in connection with that permanent plantation. I may say the conditions were not the best. We have to handle the stock we are shipping in the spring, about the time the planting ought to be done, and the result is we have had our planting either a little early or a little late, and the result is not as good as we would like to have it.

I have here a statement of the permanent plantations, the planting of 1908:—

Variety.	No. of Trees Planted.	Per Cent Died
Willows (cuttings).....	9,832	46.4
European Larch.....	2,406	22.2
Tamarack.....	12,015	2.1
Ash	13,308	5.4
Lodgepole Pine.....	5,745	9.8
Scotch Pine.....	3,244	4.3
Manitoba Maple.....	3,003	3.7
Elm.....	5,381	1.6
Cottonwood.....	6,906	17.6

The soil was fresh backsetting, ploughed a third time. The willow cuttings were damaged a great deal by gophers which cut off the young shoots as soon as they appeared above the ground. The cuttings were also set early in spring, while the ground was still very cold, some three weeks before the general planting was commenced. Had the cuttings been set later in the season, it is not likely that there would have been the same percentage of failures.

It is interesting to note the difference in the death rate between the European larch and native tamarack, the latter being only 2.1 per cent.

I have also a statement of the permanent plantations which is as follows:—

	Feet.
1904—Main belt of Manitoba maple, cotton-wood and willow.....	3 x 3
Plantation No. 1, tamarack and white spruce.....	3 x 3
1905—No. III, tamarack, Scotch pine and white spruce..	3 x 4
No. XI, European larch	3 x 3
No. XII, maple, cotton-wood, elm, European larch, tamarack, white birch.....	4 x 4
No. XIII, Scotch pine and white spruce, under large maples and cottonwoods.....	4 x 4
1906—No. II, Scotch pine and white spruce, alternate rows.	3 x 4
No. IV, Scotch pine (French stock)	3 x 4
No. V, Scotch pine (stock grown at Indian Head) ..	3 x 4
No. VI, cottonwood	3 x 4
No. VII, cottonwood and Manitoba maple, alternate rows.....	3 x 4
No. VIII, Manitoba maple and white birch, alternate rows	3 x 4
No. IX, American elm and green ash, alternate rows.	3 x 4
No. X, Russian poplar	4 x 4
1908—No. XIV, white willow	3 x 3
No. XV, golden willow.....	3 x 3
No. XVI, acute leaf willow.....	3 x 3
No. XVII, European larch, green ash, alternate rows.....	3½ x 4
No. XVIII, tamarack and green ash, alternate rows.	3½ x 4
No. XIX, tamarack.....	3½ x 4
No. XXIII, tamarack and Manitoba maple, alternate rows.....	3½ x 4
No. XX, lodgepole pine.....	3½ x 3½
No. XI, lodgepole pine and green ash, alternate rows.....	3½ x 3½

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No. XXII, Scotch pine and green ash.....	3½ x 3½
No. XXIV, American elm	3½ x 4
No. XXV, cottonwood.....	3 x 3
No. XXVI, cottonwood, birch, tamarack, ash, maple and willow.....	4 x 4

PLANTATIONS OF CONIFERS.

	Seedlings age in years.	Seedlings Transplanted in years.
<i>Spruce:</i>		
White (<i>Alba</i>).....	1, 2 and 3	8
Sitka (<i>Sitchensis</i>).....	2	
Colorado (<i>Pungens</i>).....	2 and 3	10
Ajanensis (<i>Jap.</i>).....	1	
Norway (<i>excelsa</i>).....		4
" (" <i>septentrionalis</i>).....	1 and 2	4
<i>Pine:</i>		
Jack (<i>Banksiana</i>)	1, 2 and 3	4
Lodgepole (<i>Murrayana</i>)	1, 2 and 3	4
Rocky Mt. (<i>flexilis</i>)		3 to 6
Bull (<i>ponderosa</i>)	1	3
Red Norway (<i>Bresinosa</i>)	3	
Scotch (<i>sylvestris</i>)	1, 2 and 3	6
Cembra.....		3 to 6
Dwarf Mountain (<i>Montana</i>)	1	6
<i>Fir:</i>		
Douglas (<i>Mucronata</i>)		5
Balsam (<i>balsamea</i>)		5
Nordmann's (<i>nordmanni</i>)	1	
..... (<i>concolor</i>)		3
<i>Larch:</i>		
Tamarack (<i>Americana</i>)	1	10 ft. high.
European (<i>Europa</i>)		7
Siberian (<i>Sibirica</i>)	1	4
Septolepis (<i>Jap.</i>)	2	
Red Cedar (<i>Juniperus Virginiana</i>)		6
Dwarf Juniper (<i>Communis</i>)		6

I think these are the main things I have to bring before the Committee.

The CHAIRMAN.—I wish you would prepare or have prepared, so that you could give it to us at some future time, a map, showing the land on the eastern slope of the Rocky mountains, that would be available for an extension of the park. When we discussed that subject before, I asked if it would not be desirable to enlarge the park. It would be of interest to us to know what land is available. We could not make a recommendation without having that information. I want the statement to cover the slope of the mountain, between the International boundary line, and say the Peace River valley.

WITNESS.—That would be to the British Columbia boundary?

Hon. Mr. FISHER.—From the British Columbia boundary down to the plains.

Mr. Fowke moved that 5,000 copies of the evidence taken before the committee be printed.

The motion was agreed to.

The Committee adjourned.

PART III.—FIRE PROTECTION ALONG LINE OF NATIONAL TRANSCONTINENTAL RAILWAY.

COMMITTEE ROOM No. 34,
HOUSE OF COMMONS,
TUESDAY, April 27, 1909.

The Select Standing Committee on Forests, Waterways and Water-powers met at eleven o'clock a.m., the chairman, Hon. Clifford Sifton, presiding.

Mr. P. E. RYAN, secretary Transcontinental Railway Commission, called.

The CHAIRMAN.—Mr. Ryan, what the committee want to learn from you is what steps are being taken to prevent the destruction of forests by fire along the line of the National Transcontinental Railway.

A. At the opening of the first season, what might be called the first fire season, after our operations were under way, would be the summer of 1905, the Commissioners issued a pamphlet in book form containing instructions to their engineering staff with respect to the observance of the laws and regulations in force in the various provinces in which their employees were operating, viz.: Manitoba, Ontario, Quebec and New Brunswick, and a summary of the laws of these provinces with respect to the preservation of the forests from destruction by fire was included in the pamphlet. These pamphlets were placed in the hands of all the engineers engaged in the surveying of the line, with instructions that the laws and regulations must be strictly observed; in addition, the summary of these laws, printed on linen, was distributed to our engineers, with instructions that they be posted in prominent places, so as to act as a constant reminder of the necessity for the exercise of every possible care for the prevention of forest fires. All the contracts subsequently entered into between the Commissioners and the several contractors for the construction of the line contain the following provisions:—

‘(a) Special precautions must be taken by the contractor at his own expense to prevent fires, and the labourers in his employ shall be subject to the direction of the engineer in the event of their aid being required by the engineer to extinguish fires occurring in proximity to the right of way.’

and

‘(b) The contractor shall conform to the fire regulations adopted by the Commissioners, and also to the laws and regulations respecting fires in the different provinces wherein the work is being performed.’

New Brunswick is the only province in which the Commissioners provide their own fire ranging service, and in that province, where the line runs through a bush country, on each residency of every eight to twelve miles in length, there is a party consisting of a resident engineer in charge, and seven to ten men stationed about the centre of each section. In addition two men act as fire wardens and constables, and patrol the line twice a day, each starting from the residency and going in an opposite direction to the other. In case of fire, these rangers have the power to call on all workmen to assist in extinguishing it. This system has worked perfectly, and no fires of any consequence have been reported since its institution.

In the province of Quebec, the provincial government appoint the fire rangers, and the commissioners, the timber limit holders, and the provincial government each pays one-third the cost of the service. In Ontario also, the fire rangers are appointed by the provincial government. Under the first system which we had in force in the province of New Brunswick last year, we had 34 or 35 fire rangers actually engaged.

Each of these men patrols five miles on each division, passing through the wooded country. On the other five miles, or the other half of the residency, the timekeepers acted as fire rangers, and each of these fire rangers had also the powers of a provincial constable. I think, I mentioned before, that we had no fires originating on our line last year that were not controlled and extinguished by our own men.

By the Chairman:

Q. Does that apply to the whole line?—A. That applies to the whole line. We had no fires originating on our line on the eastern division. In this connection I would like to read an extract from a letter which we received in February last—

By Hon. Mr. Fisher:

Q. By 'eastern division,' you mean the whole way from Winnipeg to Moncton?—A. Yes, sir. This is an extract from the letter of the Deputy Minister of the Department of Lands and Forests of the province of Quebec, dated February 2, 1909:

'I may say that the system upon which the rangers worked last season, gave better results and more satisfaction than anything we have heretofore tried. The men were under the close observance of the limit-holders, and in consequence the work was properly and efficiently performed, thus all interested parties were well pleased.'

I will submit to the committee a copy of the pamphlets which I have referred to, one dated June 1, 1905, and then a revised one dated June 1, 1908, and the posters which I referred to as being put up on trees—that is for Quebec, that for New Brunswick, and that for Ontario.

(Documents produced and filed.)

While our investigations proved that we had no fire originating on our line, we did have allegations made that fires occurred on our line. As showing our co-operation with the provincial authorities, I will read a letter from the Minister of Lands, Forests and Mines for the province of Ontario:—

TORONTO, April 9, 1908.

DEAR SIR,—I have to thank you for the information which you so kindly sent to my deputy as to contracts let by your commission in our province, together with the names of the contractors. You will, no doubt, appreciate how anxious we are about the safety of the forest along the line of construction of your railway through Ontario, and I am sure, will give us every assistance in your power towards preventing forest fires. I have read the particular specification which deals with the clearing of the right of way, and I think it is admirably calculated to reduce the danger incident to the use of fire in clearing the right of way in the summer time, if the precautions are carefully observed. The danger will be, unless some very strict supervision is exercised by some one in authority, either a non-observance of the requirement or carelessness as to burning the timber on right of way.

I do not know whether you intend to put on any special officers to see that the specifications are strictly observed. We are intending to put fire rangers along the line of your construction, with an officer in charge, and we would be delighted to have our officers work in harmony with your engineers or other officials on the work. The interests of the province in its forest wealth are enormous, and your railway will ultimately benefit largely by the traffic to be drawn from the timber, if the forest wealth is preserved from destruction. Therefore, I feel sure of your strong sympathy and assistance in all ways in our endeavour to protect the timber. There will be a number of men employed as navvies, who will be using fire for various purposes, and this will be a great source of danger. Even the use of matches by smokers may be a prolific source of fires. I would suggest to your consideration the issuing of circulars to engineers, contractors, sub-contractors and foremen requiring

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them to warn the men on the work to be careful of the use of fire, and particularly to pre-caution any of them as to the danger of throwing matches in the dry debris. I quite realize how difficult, if not impossible, a matter it is to watch large numbers of men employed in work of this kind. The only thing we can hope to do is to inculcate a spirit of care that will have a good effect.

I regret to tell you that our reports show that a large quantity of timber was burnt along the line of your surveys east of Lake Nipigon and through that country last summer. I am satisfied you gave every instructions to your surveyors as to the exercising of care, but in spite of all this, large quantities of timber, I am told, have been destroyed. I am writing you for the purpose of informing you as to what we propose doing, and of enlisting your sympathy and getting any suggestions you may have to offer.

Yours truly,

(Sgd.) F. COCHRANE.

E. Parent, Esq.,
Chairman, Transcontinental Railway Commission,
Ottawa.

The Commissioners then wrote to their Chief Engineer as follows:—

OTTAWA, April 14, 1908.

Hugh D. Lumsden, Esq.,
Chief Engineer.

DEAR SIR,—I have the honour by direction of the Board to hand you herewith a copy of a letter dated the 9th instant from the Hon. F. Cochrane, Minister of Lands, Forests and Mines of the province of Ontario, having reference to the measures taken to prevent fires along the line of our railway through the province of Ontario.

I am to request that you will issue instructions to your engineers in the province of Ontario, and to our contractors doing work in that province, that they must exercise every possible effort to enforce a strict compliance with the provisions contained in our General Specifications for Construction, our regulations, and the regulations of the province respecting the prevention of fires in the country where our work is being carried on. Our engineers and contractors have no more important duty incidental to the work of construction than the proper protection of the forests through which our line may run from destruction by fire. It may be well, as this is an opportune time, to again call the attention of our engineers and contractors generally to the necessity for the exercising of the greatest possible care in the direction indicated above.

I am to direct your attention to the reference, contained in the minister's letter, to fires said to have occurred along our line of surveys east of Lake Nipigon during the summer of 1907, and to ask you if you have received any reports of such fires, and if so, the commissioners will be glad to receive from you a report giving full particulars with regard to them. The commissioners are aware that there were fires last summer in the territory west of Lake Nipigon, which they understand from the reports already made, originated at points not on the line of our railway; and they are also aware of the fires which occurred along the line of the Temiskaming and Northern Ontario Railway which you will remember were at their height when the Commissioners passed over the line last summer. Mr. Cochrane's report of fires east of Lake Nipigon along our line of survey is, however, the first intimation they have received of such fires.

Yours truly,

(Sgd.)

P. E. RYAN,

Secretary.

9 EDWARD VII., A. 1909

The WITNESS.—Mr. Lumsden replied as follows:—

OTTAWA, April 30, 1908.

The Commissioners of the Transcontinental Railway,
Ottawa, Ont.

SIRS,—In regard to the prevention of forest fires referred to in the secretary's letter to me of the 14th inst., I may say that I have again written to the district engineers in regard to this matter, and wrote especially to Mr. Armstrong, District Engineer 'E' in regard to fires mentioned by the Minister of Lands, Forest and Mines of Ontario in his letter of the 9th instant, as having taken place along our line east of Lake Nipigon. In his reply, Mr. Armstrong reports that not a single fire was caused by our survey parties last summer. There was only one fire that he knew of in the vicinity of our line in that district, and that started between Ombabika and Roaring creek. It was supposed to have been started by Indians and burnt towards Robinson lake. This was not our line of survey, and timber is not very plentiful in that region. He also states that a great many fires which have occurred in other years have been caused by prospectors, and not by the engineers or their staff.

Your obedient servant,

(Sgd.) HUGH D. LUMSDEN.

The WITNESS.—To his district engineers the Chief Enginer wrote as follows:

OTTAWA, April 30, 1908.

To all District Engineers:

I have been asked to again call your attention to the matter of using every precaution for the prevention of forest fires in your district. You will please issue special instructions to all your engineers to notify and instruct all employees in regard to this matter, and also, confer with the contractors, and see that they use every possible effort to comply with the provisions contained in our general specifications, contracts and regulations, and that the regulations of the province in which they are working are also being strictly carried out.

(Signed) HUGH D. LUMSDEN,
Chief Engineer.

Chief Engineer's Office.

The WITNESS.—I might read the clause in the specifications with regard to the clearing of the right of way which was referred to in the letter of the Minister of Lands, Forests and Mines of Ontario:—

CLEARING.

The whole, or as much of the right-of-way as the engineer may direct, shall be entirely cleared of all trees, logs, brush and other perishable matter; all of which shall be burnt or otherwise disposed of as the engineer may direct, unless especially reserved to be made into ties, timber or cord wood. All merchantable timber, &c., cut on the right of way will belong to the Commissioners who may dispose of same as best seems fit. Unless directed in writing by the engineer, trees and brush must not be throw on adjacent lands, but must be disposed of on the right of way. Trees unavoidably falling outside right of way, must be cut up, removed to right of way and disposed of. All trees, stumps, undergrowth and brush, within such clearing, must be cut so that the tops of same shall not be over eighteen inches above surface of ground.

The WITNESS.—The regulations of all the provinces contain provisions with respect to the equipment of the smokestacks of locomotives with appliances to prevent the escape of fire. In the province of Ontario, there is a special provision for the appointment of fire rangers on railway construction. The provincial authorities took power to appoint fire rangers on all construction work that is going on in the province of Ontario in what are known as fire districts. The provision reads as follows:

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"Minister of Lands, Forests and Mines may appoint Fire Rangers on Railway Construction Work.

"During the construction of any railway passing through any of the public forests whether under timber license or not, the Minister of Lands, Forests and Mines may appoint as many fire rangers as he may see fit, whose duty it shall be to enforce the provisions and requirements of this Act, along and adjacent to the line of construction of such railway, and the expenses incident to and connected with such fire ranging shall be a debt due to the Crown from the railway company concerned, payable upon demand to the Minister of Lands, Forests and Mines, and may be recovered at the suit of the Crown in any court of competent jurisdiction."

That is all I have to say upon the subject.

The CHAIRMAN.—Does any member of the committee wish to ask Mr. Ryan any questions?

TIMBER.

By Hon. Mr. Fisher:

Q. Has any report been received from engineers on the quality of the timber in the different sections along the line of construction of the Transcontinental Railway?—A. Attached to the Interim Report of the Transcontinental Railway Commissioners for the nine months ending December 31, 1903, is a map which shows the areas of agricultural land in the district to be traversed by the railway. At the foot of the map there are paragraphs which make reference to the timber in each section in nearly every case.

Q. Each paragraph is an epitomized report on the section of country set forth above it?—A. Yes. The paragraph on the section of the line from Moncton to near Chipman, for example says: 'With the exception of a few miles, the line is running through lands either cultivated or which will be adapted for farming purposes when the spruce, cedar, and hardwood timber now growing thereon is removed.' Of the section from Chipman to Tobique river it is reported: 'Unsettled country covered with spruce, birch and hardwood.'

Q. The report does not give any indication of the amount or quality of the timber. Of the section from the New Brunswick boundary to Quebec, the report speaks as follows. 'Timber—maple, birch, ash, cedar and occasional growths of pine and spruce.' It gives an indication of the timber along the line, but not of the amount or the thickness, growth or anything of that kind. Again of the section from Weymontachene to Bell River, the report says: 'Timber—On the low lands, spruce and tamarack, on the high lands, birch, poplar, spruce and banksiam pine.' Beyond these paragraphs you have no further report from the engineers?—A. No.

FIRES SET BY WAX-MATCHES, &c.

By Mr. McLean (Sunbury and Queens):

Q. Have you adopted any regulations as regards employees carrying wax matches or cigarettes?—A. No; no regulation has been passed with respect to that.

Q. Such a regulation should be made and strictly enforced. There is great danger of fire on account of sportsmen going into the woods carrying cigarettes and wax matches?—A. The instructions which have been issued by the Commissioners would apply to the point which you have raised in regard to wax matches. I take it that your objection to the use of wax matches in the forest is that the flame is not extinguished when such matches are thrown down.

Q. Yes, and the objection applies with even greater force to cigarettes. Cigarette butts are extremely dangerous?—A. The instructions of the Chief Engineer are that lighted matches must not be thrown down at all.

Q. The ordinary match is not so dangerous as the wax match. The former will be extinguished when it is thrown down, but the latter will burn, and so is a great source of danger. The trouble in New Brunswick, is that sportsmen who go into the forest will smoke cigarettes. Men employed on the railway will go out on Sundays, taking cigarettes with them, and this is a great source of danger. You cannot watch these men when they get away from the right of way. The great danger that we fear, is from this practice of carrying and smoking cigarettes?—A. I will be glad to bring the matter to the attention of the Commissioners.

FIRE RANGING SYSTEMS.

By Mr. Tobin:

Q. Do you not think that the system of dividing districts into sections of eight miles, such as you are doing in the province of New Brunswick, is the best way of protecting the forest along the right of way?—A. That seems to be the opinion of our engineers who have had experience in bush country.

Q. Why cannot you arrange to have the same thing done in Quebec and Ontario, are you debarred by the provincial laws?—A. Well, in Ontario the provincial authorities have taken the matter into their own hands. I read the section under which they are acting. They did not approach us to make any agreement with respect to fire ranging; they simply put on their own rangers as each section of the Trans-continental Railway was let for construction. Consequently, the responsibility for the fire ranging system rests primarily on the provincial government. They evidently prefer to have the fire ranging done in that way, as they own the timber themselves. In Quebec the timber limit holders, being directly interested, together with the provincial government, approached the commissioner and suggested the method referred to. They have a fire-ranging system in Quebec the same as we have in New Brunswick. The only difference is that in New Brunswick, the fire ranging is carried on under the direction of our engineers, whereas in Quebec it is done under the direction of the Minister of Lands and Forests.

By the Chairman:

Q. The same as in Ontario?—A. The same as in Ontario.

By Mr. Tobin:

Q. But still in Quebec, the timber lands are not divided up into sections. Have they small sections the same as in New Brunswick?—A. In each of the sections that you refer to in New Brunswick, there is a residency, with a resident engineer and staff of engineers, covering a district of from 8 to 12 miles, and the fire rangers operate on these residencies.

By Hon. Mr. Fisher:

Q. In Quebec, is the fire ranging service divided up in the same way as in New Brunswick, with the exception that it is under the authority and management of the provincial authorities?—A. Yes, that is what I understand.

Q. The country is divided up into sections?—A. Into sections, but there may be shorter or longer sections.

By Mr. Tobin:

Q. I think that in Quebec, they have not the same system, at least if I have been informed aright, as you speak of in New Brunswick. To have brush lying around, which has been cut for two years, will be dangerous; and especially during the last year, as with the passing of time that brush grows drier?—A. It is a reasonable assumption I think, that the most interested people who are the timber limit holders, and the provincial government who control our timber, are going to take every precaution that is necessary, and even some that are not necessary, to prevent fire, because it is their property which is going to be destroyed, if a fire occurred.

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By Mr. McLean (Sunbury and Queens):

Q. It would seem a great hardship to holders of timber limits, or owners of forest lands, that when a railway is built through their property against their wishes—because no lumberman would permit that to be done if he could help it—that this extra expense should be imposed on them. It seems to me that the Transcontinental Railway should pay these fire ranges, and that they should be employed during the dry season. Then again, I think that they should take a strip of land wider than the ordinary right of way and keep it clear of weeds and underbrush. There will be danger from fire from locomotives in the dry season, because despite all precautions, fires are undoubtedly set by cinders and sparks from engines. It seems impossible, even with the best class of engines, to prevent sparks from escaping.

By Hon. Mr. Fisher:

Q. What is the width of the right of way?—A. One hundred feet.

Q. Is that the usual right of way?—A. Yes.

By the Chairman:

Q. What was the real reason for the distinction between the method adopted in New Brunswick and that followed in the other two provinces you have named? You have the federal authority assuming responsibility for the fire ranging in New Brunswick, but that is not the case in the other two provinces?—A. It was a matter of negotiation. The provincial ministers came to Ottawa and had an interview with our commissioners with respect to fire protection.

Q. You are now speaking of the New Brunswick administration?—A. Yes. The result of the negotiations and counter propositions was the inauguration of the present system by the commissioners, which in practice has given satisfaction to everybody.

Mr. McLEAN (Sunbury and Queens).—It has worked very well. I was on the committee which came up to represent the timber limit holders and land owners. The province of New Brunswick holds only about 18 miles of it, the Gibson Company about 22 miles and the New Brunswick Railway Company about 60 odd miles. Then there are other land owners all along the route of the railway. The provincial government, you see, has only a small interest as a land owner. The commissioners saw the necessity of adopting these precautions and of having extra fire wardens. The engineers stated that they had their own work to perform, and could not afford the necessary protection. Therefore, it was arranged to have fire wardens appointed. The system has worked well and has so far afforded ample protection.

Hon. Mr. FISHER.—You are speaking of the private owners of that timber?

Mr. McLEAN (Sunbury and Queens).—Yes.

Hon. Mr. FISHER.—Do they own the timber in fee simple?

Mr. McLEAN (Sunbury and Queens).—Yes

Hon. Mr. FISHER.—It is different in the provinces of Quebec and Ontario?

Mr. McLEAN (Sunbury and Queens).—The New Brunswick Railway Company, the Gibson Company and the other owners own the land.

Hon. Mr. FISHER.—They own the land as well as the timber?

Mr. McLEAN (Sunbury and Queens).—That is right.

Hon. Mr. FISHER.—Do they pay any timber dues to the government?

Mr. McLEAN (Sunbury and Queens).—None.

By the Chairman:

Q. The situation amounts to this, Mr. Ryan: In New Brunswick you pay practically all the expense of fire patrolling?—A. Yes, we pay it all.

Q. And in the provinces of Quebec and Ontario, you do not pay any of the expense incurred?—A. In the province of Quebec, we pay the expense jointly with the timber limit holders and provincial government.

Q. Does that amount to one-third?—A. Yes.

Q. Do they require to pay it in Ontario?—A. Bills for the cost of the fire ranging service have been rendered to the Commissioners. They have not been paid yet.

Q. The Ontario government has rendered the bills?—A. Yes.

Q. Do you understand that the commissioners acknowledge responsibility for them?—A. They do not acknowledge any legal responsibility.

Q. Do they intend to recommend the payment of these bills, has that been settled?—A. No, that question is not settled; it is still outstanding.

Q. You are not aware that any determination has been arrived at?—A. No.

Mr. MCLEAN (Sunbury and Queens).—I understand the provincial authorities of New Brunswick intend to put a tax on forest lands; the province to contribute a certain proportion, so as to create a fund to be devoted to fire protection and are organizing a regular service for that purpose. It will be similar to that in force in the state of Maine, a system of having watchmen on mountains and high grounds, telephone communication and a force of fire rangers during the four or five months of dry season. By means of this system on the first observance of fire, notice can be sent to a central point and protective measures adopted. These are the details practically of the system that is proposed.

Hon. Mr. FISHER.—That system has not yet been made law.

Mr. MCLEAN (Sunbury and Queens).—No, the authorities are trying to get it put into force next year. When you think that two or three years ago, property owned by Mr. Knight, Mr. George McAvity and Mr. Cutler was burnt over for a large area and considerable valuable lumber destroyed, which made a clean sweep right down to the Bay of Fundy, you can see the importance of adopting effective precautions. That fire was started by some fishermen who went into the woods, and I suppose got intoxicated. The lumbermen in New Brunswick do not intend to allow such a thing to occur again, if they can help it. They are asking now that sportsmen shall not go into woods, except in charge of a licensed guide who shall be made responsible for the adoption of precautions against fire.

Hon. Mr. FISHER.—That law would only apply on the property of the government, I suppose?

Mr. MCLEAN (Sunbury and Queens).—No, it is going to be generally applied. The lumber owners as far as they can, will prevent sportsmen from going on their lands unless they are in charge of one of their own men.

By the Chairman:

Q. Are the notes on the map produced by you, the results of the reports of your own engineers?—A. Yes.

Q. That is information obtained by your survey parties?—A. Yes.

Q. You would no doubt have information a little more specific in character in regard to the timber?—A. We might be able to get it for you, I will ask about that. If there is any such information it will be with our chief engineer.

Q. Then as to water courses, you would have full information because the surveys and profiles of the engineers must show them perfectly?—A. Yes.

The CHAIRMAN.—It seems to me that we ought to have from the Transcontinental Railway Commission, a statement of the water courses that are traversed by the Transcontinental Railway, the approximate volumes of the streams and how they run, and any remarks that might be made by the engineers in regard to the amount of power that can be developed on the line. It would be desirable to have that information collated in such shape that it will be available for parliament.

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Q. Then if it is the agreement of the committee, I will request you, Mr. Ryan, to have a statement of that kind prepared from the information available in the surveys and reports of the engineers. You need not attend here again but compile the information and file it with the secretary in writing. First, as nearly as you can, give an estimate of the amount and character of the timber. Then supply a statement of the water courses that are crossed by the railway and their volume, so that we can have a fairly definite idea as to what are the resources of water-power along the line of railway.

By Mr. Tobin:

Q. As to cleaning up brush along the right of way, how many years are allowed to a contractor to do that?—A. We do not place any limit as to the time of clearing. I suppose the limit is the time within which the contract must be completed.

Q. Is the clearing of the right of way included in construction?—A. Yes.

By the Chairman:

Q. The clearing is part of the contract?—A. Yes. They cannot do any grading until they have the line cleared. They have to clear out 100 feet wide according to the specifications.

By Mr. Fowke:

Q. They must burn or otherwise destroy it?—A. Yes.

WIDTH OF RIGHT OF WAY.

By McLean (Sunbury and Queens):

Q. Is it the opinion of your engineers that a width of 100 feet is sufficient, or that a broader belt should be kept cleared of weeds, under brush and vegetable matter?—A. The engineers prepared the specification.

Q. A hundred feet is what you take, where it is clear?—A. Yes.

Mr. MCLEAN (Sunbury and Queens).—A broader belt should be taken than 100 feet. That is not sufficient in the dry season to afford the necessary protection from fire, because on each side of the hundred feet, a lot of inflammable material will gather, stuff thrown from the railway, and so on. Sparks from the engine would quickly set this afire, and it is very difficult to watch and control. Unless you have a broad enough belt on each side of the right of way, kept clear of weeds and stuff, there will be great danger of a big fire being set. If you adopt the precaution I suggest, there will be practically very little danger.

The CHAIRMAN.—I observe that the right of way on the Canadian Pacific Railway going west is kept cleared for a considerable width; they have increased the clearing. It struck me that it might have been nearly a quarter of a mile wide altogether. It is very considerable in width.

Mr. MCLEAN (Sunbury and Queens).—It would not cost the Commissioners very much to expropriate this forest land. Now would be the time for the Commissioners to make provision for a right of way of a proper width, and the interest of the lumbermen themselves would cause them to sell land cheaply for clearing purposes except where it was needed for stations.

Hon. Mr. FISHER.—I think that 100 feet in width is the standard width of railroad right of way in Canada.

Mr. TOBIN.—Yes, I believe so.

Hon. Mr. FISHER.—Is 100 feet the standard width of railway right of way by the Railway Act?

The CHAIRMAN.—I do not think so. I was under the impression it was wider than that.

Mr. TOBIN.—The Grand Trunk Railway right of way is 100 feet.

Hon. Mr. FISHER.—The standard right of way of the older railways in Quebec is 99 feet.

The CHAIRMAN.—My impression was, it was 132 feet.

Hon. Mr. FISHER.—Not in Quebec. In that province it is 99 feet.

The CHAIRMAN.—Yes, that is the old law.

Hon. Mr. FISHER.—I am not sure whether the Railway Act continues that width or not.

The CHAIRMAN.—Probably it does.

By Hon. Mr. Fisher:

Q. In speaking about the clearing up of the approach, do you require that to be done as construction work goes on?—A. Yes.

Q. So that it is completed at once, that is to say, that the brush cut this year has had to be cleaned up and burnt this year, or do they leave it over?—A. The progress of the work would determine that. The contractors would have to do that in order to get ahead with the work.

Hon. Mr. FISHER.—As Mr. Tobin says, the longer the brush lies there, the more inflammable it becomes and hence the greater danger from fires.

The CHAIRMAN.—In certain parts of the country, it is very difficult to do that. Where the land the railway is going through is swampy, it is not until the railway drains have dried out the moss and that sort of thing that they can burn it. A great part of the country along the line of the Canadian Pacific Railway in the west could not be burnt out at all until it was drained. Of course, it ought to be done before the contractor leaves his work.

The WITNESS.—Yes, he has got to do it.

The CHAIRMAN.—The most destructive thing, according to my observation, is the dry moss. The swampy country to which I refer, is always covered with thick moss, but when the railways drains dry that out, it is like tinder, a spark falls into it, and it goes right off into a flame. It is very essential that that moss should be burnt off.

By Hon. Mr. Fisher:

Q. I do not know whether you have reached the point now on the Transcontinental, but when your construction is finished will you still keep up the fire guarding?—A. We have not reached any point yet which involves the determination of that question.

Q. Construction is still going forward?—A. Yes.

By Mr. Tobin:

Q. You were talking of New Brunswick. When construction is finished, will this fire ranging be done in divisions of 5 or 10 miles?—A. We have not completed any section yet, but the fire ranging service will, I think, be continued through the wooded country. Regardless of whether our men are working there or not, the line will be patrolled just the same.

Q. You do not know whether in Quebec they have created divisions of 5 or 10 miles?—A. Last year, they had so many fire rangers and each one had a certain amount of territory to cover.

By Hon. Mr. Fisher:

Q. You do not know the extent of that?—A. No.

By the Chairman:

Q. In Quebec, I suppose, the man who is in charge of the fire ranging service is a provincial government employee?—A. Yes.

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Q. Who is the head man in Quebec?—A. Mr. Turgeon is the minister.

Hon. Mr. FISHER.—I think Mr. Sifton means a man who was in charge of the work, and not the minister.

Mr. TOBIN.—Mr. Hall is the chief fire ranger.

By the Chairman:

Q. I mean the man who is practically in charge of the fire ranging service on your line?—A. The work is done under Mr. Hall.

By Mr. Tobin:

Q. Yes, and a very reliable man he is; I know him perfectly well. If I understand you aright, you said that was an arrangement made between the Transcontinental Railway Commission and the limit holders?—A. Yes.

Q. That is a special arrangement, because of the laws of the province of Quebec—unless those laws have been changed—the limit holders have the right of paying for the fire protection themselves. Years ago under the law, payment used to be according to the mileage. You paid 5 or 10 cents extra down then, and they supplied fire rangers themselves. But of late, the government get us to name a fire ranger, whom they must approve of, for a certain district, and the limit holder would pay the charges?—A. But that arrangement does not contemplate a railway running through the timber. That is where they pay for the protection of their own limits.

Q. It is a special arrangement?—A. In the case of a provincial railroad running through the forest, the provincial government has supreme authority. But we are a Dominion corporation, the railway is owned by the Dominion government, and consequently the fire ranging service had to be a matter of arrangement.

By Mr. McLean (Sunbury and Queens):

Q. When was that arrangement made?—A. A year ago this spring, prior to starting of last season's operations.

Q. It was an arrangement for fire protection?—A. Yes.

By Mr. Tobin:

Q. It does not seem reasonable that where a railroad is going through the timber limits of any man, the government should compel him to pay extra for fire protection?—A. So far as that is concerned, the timber limit holders themselves must first take the initiative.

Q. For his own protection?—A. Yes.

The CHAIRMAN.—Do the regulations in the province of Quebec require the limit holders to continue a certain proportion of the cost of fire protection?

Mr. TOBIN.—Not a proportion; he pays the whole cost. He names a party who must be approved by the government.

By Mr. Monk:

Q. How did we acquire the right of way in the province of Quebec for the Transcontinental Railway? Most of the line, I suppose, runs through government property?—A. I do not know the proportion of the line that runs through government property. There is a very large proportion which does not. The government of Ontario gave us the right of way, free of charge.

By Hon. Mr. Fisher:

Q. On government land?—A. Yes, on government land.

Q. What was done in the province of Quebec?—A. I am referring to the province of Quebec.

Q. You said the province of Ontario?—A. I beg your pardon, I meant to say the province of Quebec.

Q. That is where the right of way is on government land, of course. For the right of way on private land you expropriate?—A. We buy the land and pay for it.

VALUE OF FOREST LANDS ALONG RAILWAYS.

Mr. McLEAN (Sunbury and Queens).—Coming back to a matter which was mentioned by a member of the committee, it seems to me that it is an important point which ought to be dealt with first. The owner of forest lands would not, if he could help it, have a railroad run through those lands. Yet when a railroad is built, practically against his wishes, his land is taken away from him for right of way and the burden is imposed on him of affording protection, which means a large extra expense. It seems to me that a railroad ought to take a broad enough belt through the forest so as to relieve the owner of the land from some of the expense of fire protection, because a hundred feet of right of way when locomotives are running through the country, in the dry season, scattering sparks and cinders over a certain distance, is not sufficient protection.

Hon. Mr. FISHER.—Surely the passing of the railroad through the land improves the value of the owner's property?

Mr. TOBIN.—Not always.

Mr. McLEAN (Sunbury and Queens).—Not in the case of forest lands. The owners of such lands would not allow settlers to enter. The railway improves the value of the property around divisional points or stations. In other cases, the railway diminishes the value of forest land.

Hon. Mr. FISHER.—It may for the moment, but I think eventually the railway would decidedly increase the value of the timber, especially where your limits are situated away back.

Mr. McLEAN (Sunbury and Queens).—Not in the case of spruce limits where the land is not good for farming, but produces the best lumber. Land suitable for farming might improve in value. Where there are spruce limits, a wider belt should be taken than in the cultivated districts. One hundred feet is enough where there is cultivated land, but for forest land, that width of right of way is not sufficient.

Mr. TOBIN.—The lands in the northern part of Quebec could not be operated, if it were not for the Transcontinental Railway which will greatly improve the value of the limits.

Mr. MONK.—Does the railway improve the value of the limit holder's property, it does in the case of a land owner.

Mr. TOBIN.—Improves the limit holder's property, if he can bring his lumber to the railway by driving 40, 50 or 60 miles, instead of driving 4 or 5 hundred miles and then taking it down the St. Lawrence.

Mr. WHITE.—Would not the proportionate cost of railway transportation be greater than that of water transportation?

Mr. TOBIN.—The limits in northern Quebec could not be operated, or at least the greater part of them, if it were not for railway transportation.

Mr. McLEAN (Sunbury and Queens).—That may be so in northern Quebec, but in New Brunswick, the Transcontinental runs through well watered country, and the lumbermen would not use the railroad, because they have got easy access to the main rivers, through the numerous streams.

Mr. TOBIN.—Of course, it depends upon how lumbermen are situated.

Mr. McLEAN (Sunbury and Queens).—That is an important fact.

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Mr. TOBIN.—I think it will greatly boom the value of limits in northern Quebec to have the Transcontinental Railway running through there. Property has increased probably 4 or 5 hundred per cent.

Mr. McLEAN (Sunbury an Queens).—Where a railroad is being built, if the land is going to improve in value, the government will get the benefit when the country becomes settled. What I am saying is that the cost of land for a right of way at present, would be comparatively small and, therefore, a sufficient width should be taken to prevent the possibility of any danger from fire.

The CHAIRMAN.—Does any member of the committee wish to ask Mr. Ryan any further questions, as he is required at his office in a few minutes? There is nothing further. The committee will excuse you, Mr. Ryan, and the secretary will give you a memorandum of what we want. I will ask Mr. Campbell of the Forestry Department to prepare for us some information with regard to the possible extension of the forest reserve on the eastern slopes of the Rocky Mountains. If there is nothing further before us to-day, and if it is agreeable to the committee, I will ask him to bring us that information on Friday at half past ten.

Mr. TOBIN.—Are the reports of the evidence taken before the committee to be printed this session?

The CHAIRMAN.—We are in favour of printing the evidence which has been given up to to-day. No order has been made in regard to printing the evidence of Mr. Ryan as yet. We have already reported in favour of printing the evidence of Messrs. Young and Campbell. It is for the committee to say what they will do about this further evidence. I should think the committee would be allowed to print the later evidence also.

Mr. MONK.—Is it not intended to print all the evidence?

The CHAIRMAN.—Yes

Hon. Mr. FISHER.—We have not yet adopted a resolution to that effect. At the last meeting, it was ordered to print the evidence given up to that day. I should think all the evidence ought to be printed.

The CHAIRMAN.—I can include that in the report if that is agreeable to you. Then the committee so orders?

Hon. Mr. FISHER.—That would cover the evidence which has been given by Mr. Ryan to-day, and what Mr. Campbell proposes to say as a supplement to his former evidence.

Committee adjourned.

PART IV.—FOREST RESERVATIONS.

COMMITTEE ROOM No. 34,

HOUSE OF COMMONS,

FRIDAY, April 30, 1909.

The Select Standing Committee on Forests, Waterways and Water-powers met at 11 o'clock a.m., the Chairman, Hon. Mr. Sifton, presiding.

The CHAIRMAN.—I suppose, gentlemen, we shall not be able to have any more meetings during the present session for the purpose of taking evidence, because the Prime Minister has given notice of a resolution calling for morning sessions of the House after Monday next. Unfortunately we have not been able to accomplish as much as we would have, had the committee been formed early in the session. Hereafter we will have to begin at the commencement of the session if we are going to do any effective work, because towards the close of the session, members are interested in matters before the Public Accounts, Private Bills and Railway Committees, and it is impossible to get them to spend very much time in a committee of this character. Next year, however, we hope to start our meetings very early in the session. To-day we must decide as to whether we shall make any special recommendation to the House as the result of the evidence taken. That is to say, whether, having come to any conclusion, we desire to recommend that any special measures be taken. We must decide that before we separate.

Mr. BELAND.—What is your opinion about the report we should present, Mr. Chairman?

The CHAIRMAN.—My own view is, there is nothing we have sufficiently investigated to justify making a report on, unless it should be in connection with the matter that is coming up to-day. That is a subject that calls for action as early as can be taken, because every year that passes, will see some of the lands in question occupied for one purpose or another, and make it more difficult to secure a proper reservation. Consequently, if the committee is clear enough in its grasp of the facts of the case, I would be glad to see a recommendation made in regard to this particular matter, because I think it is of the very greatest importance.

Mr. CAMPBELL, Superintendent of Forestry, recalled and examined.

AVAILABILITY OF LAND FOR FOREST RESERVES.

By the Chairman:

Q. We wish to obtain from you this morning some information as to the availability of land on the eastern slopes of the Rocky Mountains?—A. I have with me a sketch plan showing in a general way the eastern slope of the Rocky Mountains. From the International boundary, the boundary between the provinces of British Columbia and Alberta follows the summit of the Rocky Mountains to the 120th meridian west. From this point, the boundary leaves the summit of the Rocky Mountains and follows the meridian north. The districts already reserved are: first, the Rocky Mountains Park, north and south of the main line of the Canadian Pacific Railway, outlined in white. The first reservation in this district was made in 1887. Subsequently it was enlarged, and now comprises 4,500 square miles, or 2,880,000

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acres. This white outline further north covers a reservation known as Jasper Forest Park. It is along the line of the Grand Trunk Pacific, and the purpose of the reservation was the creation of a park similar to the one on the main line of the Canadian Pacific Railway. Jasper Park comprises an area, as near as we can compute it, of 5,000 square miles or 3,200,000 acres. The only other reservation established along the eastern slope of the Rocky Mountains is the small one shown at the boundary surrounding the Kootenay or Waterton lakes. That is only a small reservation of 54 square miles or 34,560 acres.

By Mr. Macgrath:

Q. Should not those lakes be called the Waterton lakes?—A. They are known as the Waterton lakes and when the Bill creating those reservations was submitted, that was the name first given to them, but it was changed afterwards.

Q. I know that the late Dr. G. M. Dawson took that question up at one time. We call them the Waterton lakes, but they are called the Kootenay lakes in British Columbia?—A. I think it would be better not to confuse the name of those lakes with those of the lakes in British Columbia. I do not know why the change in question was made. The total of these three reservations is 9,554 square miles or a total of 6,114,560 acres. They are not surveyed, and the areas given are approximate.

By the Chairman:

Q. This land here (*i.e.*, along the slope of the mountains) is not surveyed?—A. No.

Q. These lines are just projected?—A. Yes.

Q. Of the land shown on the map, has any of it been surveyed?—A. It has been surveyed up to the line of the foothills shown by a white line on the map.

Q. Can you indicate the line which shows what might approximately be the land between the prairie country and the wooded public lands on the foot hills of the Rocky Mountains?—A. Yes, I should have had a map on a larger scale to place before the committee, but those who have the maps close to them will notice that we have drawn a line commencing at the International boundary. We could go east of the Waterton lakes reservation, because the mountains there run out farther to the east; in fact the reservation which has been established by the government of the United States in the state of Montana goes considerably east of that again. It extends, I should say, about three townships to the east of anything we are proposing to reserve.

Q. What is the character of the land in these three townships to the east, is it wooded?—A. No, they extend into the foot hill country upon broken land. It is more grazing land than anything else.

Q. Not suitable for settlement?—A. The lands are not suitable for settlement; they are better adapted for grazing land. We had an examination made of this part of the eastern slope last summer and a report made upon it. This was the tract that the officer, who made the examination, recommended should be reserved. I might say that the United States government had some unofficial communication with us in regard to having a reserve north of the International boundary to correspond with the one they have to the south. The matter was also brought to the attention of the government by people on this side of the boundary line and we had an examination made of this tract by Mr. MacMillan, who recommended that it should be included in the reserve. That takes in the following described tract:—

Tract 'A,' commencing at a point where the Belly river interests the International boundary in township 1, range 28, west 4th meridian; thence north following west bank of said Belly river, to its intersection with the northern boundary of the Blood Indian timber reservation, thence west one mile, thence north one-half mile to the

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north-east corner of section 30, township 1, range 28, west fourth meridian; thence west four miles, thence north four miles, thence west three miles, thence north three miles, thence west six miles to north-east corner of township 2, range 1, west 5th; thence north 12 miles, thence west 12 miles, thence north 36 miles to the north-east corner of township 10, range 3, west 5th; thence east 12 miles to the south-east corner of township 11, range 1, west 5th; thence north 24 miles to the north-east corner of township 14, range 1, west 5th, thence west six miles to north-east corner of township 14, range 2, west 5th; thence north six miles to north-east corner of township 15, range 2, west 5th; thence west six miles to north-east corner of township 15, range 3; thence north 12 miles to north-east corner of township 17, range 3, west 5th; thence west six miles to north-east corner of township 17, range 4; thence north 12 miles to the north-east corner of township 19, range 4, west 5th; thence west six miles to north-east corner of township 19, range 5, west 5th; thence north 24 miles to north-east corner of township 23, range 5, west 5th; thence north 24 miles to north-east corner of township 23, range 5, west 5th; thence west six miles to north-east corner of township 23, range 6, west 5th; thence north six miles to north-east corner of township 24, range 6, west 5th; thence west eight miles more or less along the line between townships 24 and 25 to where it intersects the south-eastern boundary of Stony Indian reserve; thence south-westerly following the boundary of said reserve to where it intersects the line between ranges 7 and 8, west 5th meridian, said line being the eastern boundary of the Rocky Mountains Park of Canada; thence south following said line between ranges 7 and 8 to the intersection with the boundary between the provinces of Alberta and British Columbia; thence southerly following said boundary to its intersection with the International boundary; thence east along the International boundary 17 miles, more or less, to the place of beginning, containing by admeasurement 3,148 square miles, more or less. North of township 10 are the Porcupine Hills, which extend further east into the prairie country than the mountains do at any other point. I am not sure how far the Porcupine Hills should be included in the reserve, but I think they should be. When Mr. Stewart, my predecessor, was considering the matter, he thought so too. That would carry the line east at the north point of township 10 over to the 5th meridian, then north over four townships, about 24 miles, following the fifth meridian. We think that would take in what should be included in the forest reserve, and as far as we know at the present time, it would not embrace any country that should not be included. If this reservation should be made, and it was found later on that land had been included, that absolutely should not have been, some arrangement might be made for its withdrawal.

By Mr. Magrath:

Q. Are you discussing tract 'A'?—A. Yes.

By Hon. Mr. Fisher:

Q. When you speak of land that possibly should not be included in the reserve, do you mean because it is land fit for settlement?—A. Some of the land may be fit for settlement; we have not made a close observation to be absolutely certain about it, but I do not think there is any land inside of these lines of demarcation which could not be administered within the forest reserve just as well as outside of it.

By Mr. Fowke:

Q. What do you mean to imply by the expression 'forest reserve'?—A. The main purpose of the tract will be the preservation and management of the forests.

Q. Land taken off the public market and not available?—A. Land that would not be left open for general entry and disposal, the same as land in other places.

Q. It does not necessarily mean then that you are keeping this land for park purposes?—A. A reserve is not maintained for park purposes. The main purpose of

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its establishment is the protection and management of the forest. Instead of forest protection being a secondary or third consideration, it would be in the main one, and other considerations would be subsidiary to it. For instance, there are some parcels of land in the valleys that are fairly suitable for agricultural purposes. These would not be open to settlers, or to any body who liked to get in, but would be examined first and a decision reached as to whether or not they should be allowed to be settled on. The interests of the forest would be considered before entry would be granted or persons permitted to settle on the land. That is what I mean. Inside the reserve, the forest should be made the paramount consideration.

By the Chairman:

Q. Under the terms of the Forest Reserves Act, as it now stands, you cannot permit any settlement inside forest reserves?—A. No, not under our Act as it stands. The United States, in the administration of their western reserves, allow settlement. That is, they do not allow anybody to go in and settle down anywhere he likes, but where they find lands which are fairly good for agricultural purposes and are not required for some special purpose in connection with the timber or the preservation of the water supply, the government will allow settlement on them. That policy has this advantage: if you have people living on a reserve who are in sympathy with the objects of the reserve and are prepared to assist in the protection of the timber, it is useful to have them convenient, because in case of fire, they can be called out to give their assistance and they can be reached much more conveniently than if it were necessary to go outside the reserve to obtain assistance.

We will call the tract from the international boundary to the Rocky Mountains Park, tract 'A,' the tract from the Rocky Mountains Park to Jasper Park, tract 'B,' and the tract north of Jasper Park, tract 'C' for the purpose of enabling you to intelligently follow the explanation. In connection with the disposal of the lands, you will notice, in yellow on the plan, the lands that have been disposed of. There are also some up here that are held for the same purposes. I do not think that, in making of this slope a reserve, we need interfere with coal mining operations at all. In fact, I consider that for the future of those operations, it is absolutely essential that this eastern slope should be protected and kept in forest, because the supply of material that is required for coal mining operations from the forest is very considerable. Not only must the props for the supports of the roof of the mine be taken out from the forest, but there is a great deal of material required for lagging—slabs and other materials of that kind, as well as lumber—used in connection with the operation of mines. Unless the mines can get a supply of that material, they cannot maintain their business. The obtaining of a supply of this material at a reasonable figure is also an important consideration because, unless that supply is obtained close to the mines, the cost of coal mining is considerably enhanced and also the cost to the consumer.

TIMBER CUTTING ON RESERVATIONS.

By Mr. Magrath:

Q. The mine owners are not allowed to take any green timber, are they?—A. Yes, they are. Where they have acquired any rights of a timber limit; but, as a rule, they would prefer to take the dry standing timber, which has been seasoned to a certain extent, because it is lighter than the other timber, and, so far as strength is concerned, is just as good. The trouble with the mining timber is that it finally succumbs to the pressure, and not so much that it becomes decayed.

By Hon. Mr. Fisher:

Q. Have you any special regulations in regard to the timber on the slope in tract 'A' or is it being dealt with in the same way as the rest of the timber in the North-

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west?—A. It is administered under the same regulations, there is no special regulation.

Q. And permits to cut the timber are being issued?—A. Permits are being issued in the same way as in the case of any other tracts of Dominion lands that are afforested. There is no special departmental regulation relating to that district at all.

Q. None with respect to the Rocky Mountain slope?—A. Except the parks.

By Mr. Magrath:

Q. The timber they use is about 6 inches in diameter, is it not?—A. About 6 inches would be the general run, but in coal mining operations in the larger galleries, the diameter of the timber is considerably larger.

Q. Have you any idea of the proportion of timber that is used per ton of coal so as to give some idea as to the amount of timber that is being used in that district?—A. I have a statement of the consumption of timber by the companies operating in the Crow's Nest valley. Taking the International Coal and Coke Company, the figures are as follows for a season: lineal feet props and ties, 800,000; feet board measure lumber and dimension timber, 1,500,000; feet per ton of coal, 2 feet lineal and 4 feet board measure. West Canadian Colliery gives 2 feet lineal and 1 foot board measure, per ton of coal; Maple Leaf Colliery $3\frac{1}{2}$ feet lineal and 1 foot measure per ton; and the Alberta Railway and Irrigation Company 3 feet lineal and $1\frac{1}{2}$ feet per ton. The total of lineal feet of props and ties used in that district according to this statement is 3,002,300, and of lumber and dimension timber, 2,592,700 feet board measure.

By the Chairman:

Q. During what period?—A. That is for a year. It is expected, of course, that all these mines will increase their output, and it was calculated that within 5 years they would need about twice, or very close to twice that quantity, in order to supply their needs for 12 months.

TIMBER RESOURCES FOR MINING PURPOSES.

By Hon. Mr. Fisher:

Q. In the existing forest reserves, is any cutting allowed under the regulation?—A. Yes, we allow settlers to cut. That is the only use of the timber that we have provided for. The reserves so far formed, have been mainly reserves that would supply timber for that purpose and not for the general trade. The first purpose, of course, is to supply local needs. If later on, it is found there is sufficient timber to produce a supply for more than local needs, I see no reason why the timber should not be disposed of.

Q. Under your Forest Reserves Act, you may frame regulations by which the timber can be used commercially. Does the Act empower you to?—A. Yes.

Q. So that if this portion of country, now under consideration, were put into a reserve, you could frame regulations by which a supply of timber for the mines could be obtained?—A. Yes.

Q. Under regulation?—A. Yes. One of the chief purposes of that reserve would be to supply the mines.

Q. And the needs of the mines are not an insuperable obstacle to putting this part of the country into a reserve? A. Not at all. In the end, the mines will need quite a large quantity, and it is advisable to thoroughly protect the timber just as quickly as we can.

Q. Then the putting of this district into a reserve would be an advantage to the mines in the future —A. Yes, it would be, and I think the mine owners generally would be prepared to support an arrangement of that kind. When Mr. McMillan went to look over the Crow's Nest valley, I told him the first thing to do was to visit the

mines and talk the matter over with the managers and owners so as to find out the local situation as well as he could. After doing so, he reported that the mine owners were, as a rule, interested in the matter, and would be prepared to support a policy of holding that land as forest land. In his report he says:—

‘The mining industry is the most important in several of the western towns. Coal cannot be mined without timber. Mines in Pennsylvania, after spending large sums of money in importing timber, found it more satisfactory to grow it at home. The mining of the 22,515,200,000 tons of coal estimated by the Geological Survey to exist in the Alberta coal field, will require 45,190,400,000 lineal feet of mining props, the product of 9,000,000 acres for sixty years. That timber is not in sight in the whole coal district, nor is the reproduction coming on that will produce it. Yet the land is there, capable of producing nothing else. The lack of mining timbers near at hand will render mining of coal more expensive. The extra expense will be paid by the western settlers in the shape of a higher price for coal.’

I have not just under my hand the statement he made in regard to the attitude of the coal companies. However, it was in favour of the protection of the timber.

By Mr. White:

Q. Does the government impose any restrictions as to the size of timber the mine owners are allowed to cut?—A. Where the land is held under timber license, they are not allowed to cut under 10 inches in diameter.

Q. But the props used for mining purposes are much smaller than that?—A. Yes, the props for mining purposes. Where dry timber is used they cut considerably smaller than that; in fact, they cut whatever size they can get. We have not given them the right to cut small green timber.

Q. Not even for mining purposes?—A. No.

By Hon. Mr. Fisher:

Q. You give the mine owners a special license to cut timber for mining purposes?—A. We give a special permit for mining purposes to a mine owner.

Q. You spoke about the yellow patches on the map representing coal lands. I see from the description that there are railway lands among them?—A. They are nearly all mining claims; the only railway lands are those in the Crow’s Nest district that belongs to the Canadian Pacific Railway. There are a few Canadian Pacific Railway lands near the edge of the tract, but the remainder are coal lands. There are some petroleum claims down here, near International boundary (pointing to map).

By the Chairman:

Q. What fee do you charge the mine owners for the timber?—A. I cannot tell you that offhand.

Q. The timber is not free?—A. No. There is a rate per lineal foot according to the size of the timber. I might say that these lands, shown in yellow, have an area of 200 square miles altogether, or 128,000 acres. In addition to that there are Hudson Bay Company’s lands. We have not indicated them on the plan, but they are scattered through each township. The Hudson Bay Company has the right—

Q. That is only in the fertile belt, though?—A. It appears to have been decided that their right extends to the summits of the Rocky Mountains.

Q. I do not think that is right?—A. I made inquiry of the Patent Branch before I came here, to see what view had been taken by the department of it, and they said, that was the decision that had been reached.

Q. Some agreement may have been arrived at of which I am not aware, but my impression is, that, under the terms of the deed of settlement they would not be

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entitled to take forest land, or land that was not fit for settlement—agricultural land?—A. I did not know that would apply to the Hudson Bay Company.

Q. How much did you say was in this tract? I mean the whole tract that you suggested should be included in the reserve?—A. The whole area is 3,148 square miles or 2,014,720 acres.

By Hon. Mr. Fisher:

Q. And of that, how much has been granted?—A. 128,000 acres.

Q. Out of two millions odd?—A. Yes. That is not counting Hudson Bay Company lands. If Hudson Bay Company lands are included in that area, it will make 135,000 acres more.

Q. Does that include the grazing lease?—A. No, that does not include the grazing lease. I have compiled our areas of timber berths and grazing lease separately. They have not been parted with. The timber berths are under regulation, and the others are merely leases.

The timber berths are under the ordinary timber regulations in force in the Northwest?—A. Yes.

Q. What is the area of those?—A. The area of the timber berths in tract 'A' is 447 square miles, or 287,360 acres.

Q. Are they marked on this map?—A. Only the outline of the timber berths are given. We were going to colour them, but they overlap the mining lands to a certain extent and we could not put on a colour that would show them.

Q. There is a very considerable quantity?—A. Yes, there is a considerable area under timber license in that southern tract.

By Mr. Tobin:

Q. What control have you over these mining companies in regard to the cutting of timber? Do they go in and cut timber over any part of the reserve?—A. No, they would not have the right to go in and cut anywhere. Some of the mining companies hold timber under license. Of course, that is a defined surveyed tract. Again, the mine owner may get a yearly permit to cut timber, but he has to define the land on which he is going to cut, before the permit is granted. The permit is for that location, and he has no right to go outside of it.

Q. What control have you as to the cutting of dry timber? Do you know whether the mine owners cut dry or green timber? Does any inspector supervise their cutting?—A. We have a forest ranger, but we are not able to keep a very close inspection of the cutting. The headquarters of our forest ranger is at Calgary. He has a very large district to cover, so that he cannot keep very close check of the timber cut, but still he goes there and looks over it now and again as he can reach that district. The whole point in making a forest reserve is, that we shall have a closer, more careful and more scientific supervision of the entire cutting of timber.

By the Chairman:

Q. There would not be any possibility of the miners making away with any timber?—A. No

By Mr. Tobin:

Q. A point of great importance is where the cutting is done. Sometimes the cutting on a limit is done in certain places where the timber is going to grow again, but the cutting is sometimes done in such a way as to leave no protection for the young trees. That idea should be kept in mind?—A. If this were made a reservation and we began to administer it, the idea would be that a place where timber is going to be cut, would be first examined and the proper method of cutting determined, so as to insure reproduction, and then only allow the cutting to be done in that way.

By Mr. Magrath:

Q. Have you only one officer operating from Calgary?—A. One regular forest ranger, but during the dangerous season we have several fire rangers on patrol. There is only one regular forest ranger who looks after the cutting operations.

By Mr. Tobin:

Q. What territory has that man got to look after?—A. As far as limits are concerned?

Q. Limits and reserves?—A. He takes the whole territory from the International boundary up to the North Saskatchewan at this point.

Q. How many miles does that comprise?—A. Do you mean in distance?

Q. No, in square miles or acres of limits?—A. The limits on the eastern slope of the Rocky Mountains in that tract, comprise an area of 697 square miles, but I have not the figures as to the extent of the limits outside of that.

By Mr. Magrath:

Q. Roughly speaking, this territory is about 300 miles long and probably 50 miles wide?—A. Yes, taking the general dimensions.

By Mr. Tobin:

Q. And there is only one inspector for all that territory?—A. That is all.

By Hon. Mr. Fisher:

Q. Has he a ranger under him?—A. During the dangerous season he has fire rangers to assist him.

By Mr. Béland:

Q. There is no personal control, he has to rely on sworn statements?—A. He checks the cutting as best he can, but he cannot keep a very close check. Still he is a good woodsman.

Q. I think if you had more men, and so placed as to be able to look after the cutting, it would be a good protection?—A. That would be the whole point in handling a reserve, to see that the cutting was done properly, not to prohibit it; that is not the idea of the reservation.

By Mr. Béland:

Q. That is you require to regulate it?—A. To so regulate it that the forests would keep on reproducing.

The CHAIRMAN.—You want to grow mature timber and make use of it, allowing the younger timber to grow.

By Mr. Tobin:

Q. Unless proper care is taken, the younger timber would not be protected, and you will lose as much timber by winds and storms in that part of the country as is cut?—A. That is one serious difficulty, particularly in the Crow's Nest valley. Very strong winds occur there, and we find that difficulty of the young trees being blown over when they are left unprotected. They have grown up in the forest and they have established a root system commensurate with the protection they have had from the other trees. When you take that protection away, the root system is not sufficient to hold them, and when a wind comes along, it is almost certain the greater proportion of them will blow over.

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Mr. MAGRATH.—I think, Mr. Chairman, it is very desirable to recommend that tract 'A' be embraced in a reserve, but I do not think there is any use in doing that, unless more men are appointed to look after the timber. If we are going to make such a recommendation, we ought also to recommend that the staff be increased, because an area 400 miles long, taking it diagonally, and from what I can see about 50 miles in width, is far too much for one man to look after.

The CHAIRMAN.—My own view is that if it is worth while to make that a reservation—and I think it very important to do so from the standpoint of the interests of the Northwest and the whole western country—the government ought to be asked to place the whole of that territory in charge of a competent warden—a first-class forester and a man of good administrative capacity—with a proper staff. Furthermore, I do not believe that any prospector should be allowed to go into the territory at all without a special permit, so that the government officer would know exactly where that man was authorized to go, and if a fire took place in the reservation, the burden of proof would be on him to show that he did not start it. Then the reservation could be properly inspected. With respect to mining companies, they will cut the timber where it is easiest to do so; they do not care where it is done. If there is timber farther away that is mature, they will not hunt for it, but will take what is cheapest to get, and will be cutting the young trees all the time.

Mr. MAGRATH.—They give a contract to some men to cut the timber. He will go where it is the cheapest to get and will not be concerned about the saving of the timber.

Mr. TOBIN.—The mining companies should not be allowed to cut any timber without having a permit from the forest ranger, and the place designated where the cutting is to be done. Then there would be more protection for this small timber.

The CHAIRMAN.—Mr. Campbell says the mine owners get permits to cut in certain places, but in practice what happens is this; the mine owner sends a man out to find where there is a sufficient supply of a certain length of timber. He then makes application for a permit to cut timber there. The officer says: 'All right, there is no objection,' and the thing is done. The officer has no time to go and make an examination; he does not know that there is mature timber a certain distance away that ought to be cut; and, therefore, he is not in a position to say: 'No, you cannot go there, we will let you cut somewhere else.' He has not got the facts to enable him to do so. It is essential that a survey of the forest should be completely and scientifically made, and then there should be a large enough staff to see that proper precautions are carried out. Anybody who has given any thought to the question of a water supply of the prairies, must recognize the importance of it, because when you reflect upon the matter, you find out how limited the area is from which that water supply is derived. All these rivers originate from this territory here. When you think how limited the area is from which that water supply is derived, you cannot help coming to the conclusion that if the timber is denuded from the slopes, there will be floods for two weeks in the spring, and a drought for the rest of the year.

By Mr. White:

Q. Have you made any estimate as to the quantity of the timber on those tracts?
—A. On this eastern slope?

Q. Yes?—A. We have made a sort of a guess at it.

Q. The point I am aiming at is this: you say that a certain amount of timber will be required in the future for mining purposes, and the question is whether there will be sufficient timber for manufacturing purposes when the mines have been supplied?—A. I think there will be if it is looked after. But if things go on—

Q. In a reckless manner?—A. As they have been going on; I do not know where it will wind up.

Hon. Mr. FISHER.—You do not know where it will wind up.

By Mr. Tobin:

Q. What varieties of timber are to be found in that area?—A. There are several species. Douglas fir grows on the eastern slope, also Engelmann's spruce. It is a very good timber, one of the best spruces. There is also Lodgepole pine.

By the Chairman:

Q. How high does that grow?—A. Lodgepole pine is found from 14 to 16 inches in diameter sometimes.

Q. But how high does it grow?—A. About 80 feet.

Mr. Mr. Tobin:

Q. That is a good deal like the jackpine, as we call it in the east?—A. Yes, it is called the western jack pine.

By the Chairman:

Q. Is the Lodgepole pine the same as the jack pine of Manitoba?—A. Not the same as in Manitoba. That is the northern jack pine, that is the jack pine of the whole northern forest in Quebec, Ontario, and across almost to the Rockies.

Q. The jack pine grows here too. Is it the same?—A. No, that is the same as in Manitoba, but not the same as this lodgepole pine. This is western jackpine. It is a different species and rather a better tree than the other.

Q. It is a tree of rapid growth?—A. It grows pretty quickly and reproduces very easily. That is one of the greatest features of the Lodgepole pine and the jack pine too; they reproduce very easily—

Q. They will grow where nothing else will grow?—A. And they have a plentiful supply of seed. They seed early in life and every year, so that anywhere you have a fire or cutting through jack pine or lodgepole pine territory, you find reproduction coming on splendidly as a rule. In lodgepole pine country, there is hardly any question of having to resort to artificial methods at all. If you will only protect it, the tree will do the work itself. The lodgepole pine is found all along that eastern slope, and it is one of the best timbers for mine props.

Q. It is a strong wood?—A. Yes.

Q. Does it last well?—A. It lasts pretty well. It might be advisable at our present stage of development to make some experiments in regard to treating timber so as to increase its life. The same thing has been done by the Forest service in the United States. They have carried out experiments in the treatment of timber in various ways, and I think it will be worth while to do some experimenting in regard to mine props in that district.

Q. What can you tell us about tracts 'B' and 'C'?—A. We have not very much information about them, but we know that generally they are afforested. A few timber limits, which you will see marked out in outline, have been taken up within these tracts, and recently a few mining claims, but outside of that we have not very much information in regard to it. This country is the source of a number of rivers. You will notice that the North Saskatchewan has its rise here, and it is important that the source of that river should be kept afforested. As you all know it is a river that flows into Lake Winnipeg. It passes through all that lower country, and it might be a very important river for navigation purposes, if it were not so unreliable by reason of the current and the sand bars.

Q. Take the Saskatchewan river after the first of July, does not most of the water running through it come from there. Very little comes from the tributaries below?—A. Not very much.

Q. The coulees and the little streams on the prairie are nearly all dry?—A. The flow of water is mostly from this main stream, and the tributaries enter it from the mountains on both sides.

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By Mr. Tobin:

Q. Is there no hardwood timber on that reserve?—A. No, except poplar.

FIRE RANGING AND PROTECTION ON THE RESERVES.

By Mr. McLean (Sunbury and Queens):

Q. You said you employed a force of rangers during the dry season. Would you kindly tell us what their instructions are, or what precautions are taken to prevent fires, and what the danger is from fires?—A. The danger is along the line between the settlements and the timber country, and our instructions to the fire rangers who are in charge of the chief ranger are—

Q. How many rangers are there?—A. We have nine from the international boundary to the North Saskatchewan river. In the Crow's Nest district we have several. We have a special arrangement there, because of the special danger along that line of railway. We made an arrangement with the Hon. Peter MacLaren, who has the largest timber interests in that country, about the fire ranging. We have eight or nine men under us, and three additional rangers are employed by Hon. Peter MacLaren. There are about from eleven to twelve fire rangers as a rule.

Q. Are you able to tell us of the danger from fire caused by cinders or sparks from locomotives passing through forest land?—A. Yes. That is one of the chief dangers we have to deal with. There is danger too along the line of settlement in connection with the clearing up of land. Men are apt to be a little careless and a fire may get away from them; they have to be watched on that account. Then there is danger from hunters and trappers who are apt to carelessly leave a fire behind them, also from prospectors coming in and doing the same thing. But the greatest danger exists along the line of railway, and it is not entirely due to the railway, but also to the number of people coming in as a result of its construction and operation. We find a certain amount of trouble always along the line of railway. It is usually difficult to prove that the railway is responsible for the setting of fires, but when Mr. McMillan was in the Crow's Nest valley last summer, he obtained evidence sufficient to satisfy him at least, that a number of the engines were throwing fire, and that fires had started as a result.

Q. You know that through the state of Maine the great number of fires are set almost every year by railway engines?—A. That is our experience in the west. Take the railway belt through the province of British Columbia. Our men are continually finding fires along the line of railway that must have been set from the railway locomotives. That is our peculiar trouble in that province, owing to the fact that the stretch of territory in question, is immediately along the line of railway.

Q. Now, I come to the next point: What sized belt should be taken as a right of way by railways through forest lands? Is 100 feet right of way sufficient protection against fires from locomotives, or how broad should the belt be that is taken?—A. That depends on several circumstances. Where you have a mature forest in good condition, the fire danger is not very great, and, on the whole, I do not think that in such a case the right of way should necessarily be very wide. If the right of way is 100 feet in width, and is kept clear and in good condition with a mature forest coming up to the edge of it, I do not think there is going to be any very serious danger of fire. The trouble is, that all along our lines of railway the conditions are very bad for fires. There is dry material lying everywhere. More than that, when cutting has been done along the railway, debris and refuse are left lying. In such cases, where that sort of material is left lying along the railway, I do not think that 100 feet right of way would be enough; but, as a permanent thing, it ought to be.

By Hon. Mr. Fisher:

Q. If the 100 feet is properly cleaned up?—A. If properly cleaned up.

Q. If that is done and the debris from it not carried into the adjacent wood, 100 feet would be enough?—A. Yes.

By Mr. McLean (Sunbury and Queens):

Q. Do you know by experiments how far these sparks and cinders are carried by a high wind from a railway engine?—A. There has not been very much experimenting in that direction, and we have not been able to undertake any exact experiments with regard to it. The only experiments that I know of, that were carefully carried out with that object in view, were some made in the United States a few years ago. I have a record of them, but unfortunately did not bring it with me this morning; otherwise I could have shown you the exact results in that particular case. At any rate, they showed that cinders of any size at all fell about 50 feet, and sometime 75 feet from the railway.

Q. That is what I was coming to. For example, in the province of New Brunswick, the Transcontinental Railway runs for about 120 miles through the best timber lands that we have. The right of way would not cost very much, and it seems to me that a width of 200 feet should be taken as a precaution against fires through the forest belt referred to. The right of way should be cleared of all brush and debris, and a strip ten feet broad should be ploughed up on each side. That would keep the fire from running in. What would you think of these suggestions?—A. I think it would be a good thing if the belt were properly cleared up.

Q. The point is, that fires are often started and run in, even where the ploughed strip is 5 feet, fire might cross it?—A. In the prairie country, the railways are required to provide ploughed fire guards, but I do not know that they always keep them in proper condition. In one case in the Crow's Nest valley, the ploughed fire guard was not kept in proper condition, and I drew the attention of the railway Company to that fact when I received the report concerning it. I think it might be a good thing to acquire a strip, such as you suggest, provided it was kept perfectly cleared. Probably in the condition in which forest lands generally are along the line of railway, it would be well to have a fairly wide strip cleared. As a permanent condition, though I would not consider that a very wide right of way should be kept cleared, because it would be really a waste to do it. Under the special circumstances of the case, it may be advisable at the present time to have a wider strip here.

Q. It would be very important that the necessary width of land should be taken by the Commissioners now, because it will not cost so much for the extra land required. Now is the time that precautions should be adopted?—A. Yes, I think that is right.

Mr. MAGRATH.—Under conceivable conditions, sparks from a railway locomotive will set a fire 300 feet from the railway. Of course, where there is a dense forest on either side of the line a strip of 100 feet will do. If there is not dense timber, I should imagine you would want a strip of more than 100 feet; it depends upon the character of the timber.

Hon. Mr. FISHER.—There is a railway running through the middle of my farm for nearly a mile, most of it upon cleared land. There will be more or less running fire during the dry season, but I do not think I ever saw it start outside the railway fence; it invariably started inside the fence and ran out. In my recollection of over 30 years, I do not remember ever seeing a fire start outside the railway fence by cinders flying over.

Mr. MCLEAN (Sunbury and Queens).—I think Mr. Campbell should carefully look into this matter, so as to advise the Transcontinental Railway Commission respecting the precautions that should be adopted. Indeed we should ourselves recommend the Commissioners to adopt these precautions, in view of the likelihood of fire starting during the dry season.

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The WITNESS.—Yes, there is no doubt of the danger, and that is the difficulty we are under in making provision for the protection of forest lands. If we had mature forests and properly cut woods as a permanent condition, I do not think we would need a very wide right of way. Under the conditions as they exist at present, however, I think it might be wise to have it. In the second place, it is certainly safer to have a ploughed fire guard outside the right of way; that is one of the best things to prevent a ground fire from spreading.

Mr. Mr. Tobin:

Q. Do you not think that where lumber is cut within a mile of any railway, the brush left lying close to the railway track should be picked up and burnt. If that cleaning was done within a distance of half a mile, the extra hundred feet suggested would not be necessary?—A. Yes, that would be of assistance undoubtedly.

By Mr. McLean (Sunbury and Queens):

Q. Would it not be advisable for some officer of the department to go over the right of way and see what precautions should be adopted, and then make the necessary recommendations?—A. That could be done if the committee thought it desirable.

Q. In the state of Maine, where the Maine Central and the Canadian Pacific Railway lines run through forest lands, big fires have been set every year, and the Commissioners there required that a broader belt should be taken in connection with the right of way, in certain places. Other precautions were adopted for the clearing up of the brush, having a ploughed strip and all that sort of thing?—A. Of course, it is important to have a patrol as well.

Q. You must have fire patrols?—A. If you have a fairly good clearing up of the right of way, and the conditions outside of it are not too bad, and in addition have a thorough patrol, you have reasonable safeguards. I do not think, however, that anything will take the place of a thorough patrol.

Mr. McLEAN (Sunbury and Queens).—No.

By Mr. Béland:

Q. We have to consider what report we shall make to the House, and then it will be all right for my honourable friend, Mr. McLean, to make any suggestions he wishes. In the meantime, we should get some information in reference to tract 'C.' You have not touched it yet?—A. We have very little information about tract 'C.' We have never made an exploration up there.

By the Chairman:

Q. You know the general nature of the country, do you not?—A. Yes.

Q. What is it like?—A. It is fairly wooded.

Q. It is a rough country, is it not?—A. Pretty rough. It is generally mountainous and broken. A number of rivers have their sources there. You will notice the Smoky river and others that run into the Peace river.

Q. What large rivers do they run into?—A. The Smoky river runs into the Peace river. The Peace river itself rises further north.

Q. That tract does go as far as the Peace river valley?—A. No, the Peace river valley is above. The British Columbia boundary goes directly north from this point to the 120th meridian.

By Hon. Mr. Fisher:

Q. I see that on your map you have divided the land into townships. Is the land surveyed?—A. No, only projected on the map.

Q. Are all these townships farther south surveyed?—A. Only where the lines are solid are the townships surveyed.

By Mr. Tobin:

Q. Is there any great quantity of water power on these rivers running through this timber tract?—A. There should be considerable water power capable of development, but we have only got measurements of them from the International boundary as far up as the Red Deer. Up to this river we have measurements which were taken in connection with the irrigation administration, but we have not measurements of the streams farther north.

Q. Are these water-powers still owned by the government?—A. They mostly are, but a few have been leased.

By Hon. Mr. Fisher:

Q. No water-powers have been developed?—A. There has been very little development.

Q. I suppose that any development would be in tract 'A'?—A. Yes. The use of the water up to the present time, has been mainly for domestic purposes—that is, the water supply for cities and towns—and what has been required for irrigation and for railway tanks.

Hon. Mr. FISHER.—Mr. Chairman, why not consider now, any recommendations to be based on the information which has been supplied us. Would it not be wise for us to consider a recommendation that these three tracts of land should be placed in a reserve?

The CHAIRMAN.—That is a matter which the committee should discuss. Necessarily, we have been limited in the scope of our work this session, by the fact that the committee was appointed very late. We have taken up two or three very important questions, but this is the most important that we have had before us, and it is the one subject in regard to which, immediate action is imperative. It may make a very great difference whether the creation of this reserve takes place this year or next year. In regard to some things, delay does not mean very much, but with a matter of this kind it is very different; some interests may arise that will make it more difficult to carry out our recommendation, or some damage will take place that might have been prevented had we displayed greater promptitude. Another fact to be borne in mind is, that public opinion on the subject is awake at the present time, and would probably support pretty strong action taken by the government. I am disposed myself to be very strongly in favour of recommending to the House that the whole of the wooded land, or land which has been wooded, upon the eastern slope of the Rocky Mountains should, so far as practicable and available, be placed in a permanent forest reserve.

Mr. TOBIN.—Would it not be a good thing to have one more meeting, and then decide what we should recommend? We ought to communicate with the several departments and the provincial governments as to the advisability of getting information for another year.

The CHAIRMAN.—It would be all right to have another meeting if it could be arranged. It is pretty hard to do so now with the beginning of morning sessions.

Mr. BELAND.—What we should do is, appoint a sub-committee to prepare a report.

The CHAIRMAN.—That might be done.

By Mr. Tobin:

Q. Do you not think, Mr. Campbell, that we should get more information from the provincial governments?—A. Yes.

Q. So that they might co-operate with your department?—A. I think it would be a good thing.

Mr. BELAND.—There is a Bill before the House which provides for an appointment of certain provincial representatives.

APPENDIX No. 4

The CHAIRMAN.—The trouble is this: Mr. Campbell represents a branch of a department, and he does what the minister instructs him to do. He has to do only with Dominion lands, with the protection of forest lands that are owned by the Dominion government.

Mr. TOBIN.—I was just asking the question in order to get his opinion upon it.

The CHAIRMAN.—The trouble is that if the Forestry Branch undertook to do very much with the provincial governments they would simply say, 'You had better attend to your own business.' A body like this committee might invite information from the members of the provincial governments, but we should hardly hold the forestry branch responsible for doing that. Mr. Campbell, how many copies of that blue print have you?

Mr. CAMPBELL.—Six.

The CHAIRMAN.—File those with our secretary, and also the figures you have brought.

Witness discharged.

The CHAIRMAN.—Can we settle what we have to do to-day, or shall we endeavour to have another meeting?

Hon. Mr. FISHER.—I think Dr. Béland's idea of appointing a sub-committee to draft a report, is a good one. I would suggest that the Chairman, Dr. Béland and Mr. Magrath form that sub-committee.

Mr. BELAND.—And yourself.

Hon. Mr. FISHER.—I would suggest that these gentlemen form a sub-committee to draft a report, and submit it on Tuesday next at 10 o'clock to the committee.

The CHAIRMAN.—Suppose we say at a meeting to be called. As soon as we have the report we can choose a convenient time and have a meeting.

Hon. Mr. FISHER.—We can meet at 10 o'clock some morning to receive the report and recommendations.

The CHAIRMAN.—Very good. Is that agreeable.

Mr. BELAND.—I understand Mr. Fisher is to be on the sub-committee?

Hon. Mr. FISHER.—No; place Mr. Wright on it.

The CHAIRMAN.—It is pretty hard to expect Mr. Fisher to come at this period of the session.

Hon. Mr. FISHER.—I have two or three Bills to put through the House. Your sub-committee can sit during the sittings of the House, but the committee cannot.

The CHAIRMAN.—We will probably get an opportunity of consulting Mr. Fisher before we report. Is it the sense of the committee our report should make such a recommendation as I have outlined in regard to this reservation?

Mr. BELAND.—It is, as far as I am concerned.

The CHAIRMAN.—That is the general sense of the committee, is it?

Mr. TOBIN.—I think so.

Hon. Mr. FISHER.—And on the general lines suggested by Mr. McLean, in the nature of a recommendation to the Transcontinental Railway Commission. We had better discuss that.

The CHAIRMAN.—Yes, we will take up each one of these points, but I wanted more particularly to ascertain the sense of the committee in regard to the other matters.

Mr. BELAND.—Mr. McLean's suggestions, of course, would apply to the whole Transcontinental Railway.

Hon. Mr. FISHER.—Yes.

Motion agreed to.

Committee adjourned.

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